L 19486-63 EWT(l)/EWP(q)/EWT(m)/EWP(b)/BDS AFFTC/ASD/IJP(C)/SSD JD
ACCESSION NR: AT3002237 S/2941/63/001/000/0290/0299

AUTHORS: Levshin, V. L.; Reshetina, T. S.; Tunitskaya, V. F.; Vasil'yeva, Ye. G.

TITLE: Stimulating action of infrared radiation on zinc sulfide phosphors

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminestsentsiya. Moscow, Izd-vo AN SSSR, 1963, 290-299

TOPIC TAGS: electron, tr p, energy level, infrared, absorption, flashing, phosphorescence

ABSTRACT: An investigation was made of the flashing process in ZnS with electrons trapped (or localized) in shallow levels under infrared excitation of wavelength 1μ to 3.5μ. The infrared response of these phosphors was studied at -77, -196 and -259C. Flash-emitting energy levels were established after obtaining the thermoluminescence curves of several zinc sulfide phosphors. The effect of infrared radiation of various wave lengths on one specimen, under varying conditions of excitation, was studied in great detail. It is shown that quenching, maximum absorption in radiation spectra, and the flash magnitude under stimulation of infrared radiation at the excitation level of 365 millimicron is 1.5 to 2.0 times lower than the excitation at λ = 312 millimicron. This is attributed to action of p-type levels

Card 1/2

L 19486-63
ACCESSION NR: AT3002237

(differences in trapped electron absorptions). A study was also made of the growth and decay of flashing and the phosphorescence damping at various temperatures. Orig. art. has: 7 figures and 4 tables.

ASSOCIATION: none

SUBMITTED: 29Jun62 DATE ACQ: 19May63 ENCL: 00

SUB CODE: PH NO REF SOV: 012 OTHER: 006

Card 2/2

TUNITSKAYA, V.F.

Thermoluminescence of ZnS-phosphors in the temperature range 14° to 77°K. Opt. i spektr. 14 no.3:445-446 Mr '63. (MIRA 16:4)
(Phosphors)

S/051/63/014/003/019/019
E039/E120

AUTHOR: Tunitskaya, V.F.

TITLE: Thermal luminescence of ZnS - phosphors in the temperature range 14 - 77 °K

PERIODICAL: Optika i spektroskopiya, v.14, no.3, 1963, 445-446

TEXT: A special helium cryostat of the type described by E.N. Lotkova and A.B. Fradkov (PTE no.1, 1961, 188) is used in these experiments. The ZnS samples are in the form of a 4 μ thick layer on duralumin (1.5 mg/cm) mounted on a resistance thermometer which is tightly screwed to a cold conductor. A heating coil is situated between the sample and the helium bath, and increases the sample temperature at a rate of 9°/min. Luminescence is detected on a photomultiplier and the 365 mμ line is used for excitation. Excitation time at 14 °K is 10 minutes; the sample is then heated after a period of one minute from the time of completion of excitation. ZnS phosphors of various types are investigated. It is shown that the shape of the thermal luminescence curve is independent of the presence of copper in the range 14 - 80 °K.

and shows a weak peak at about 70 °K. Similarly the curve for ZnS - Cu heated in molten $MgCl_2$, $BaCl_2$ and $ZnCl_2$ shows the same typical shape. ZnS - Ag heated in an atmosphere of HCl produced a broader peak with a maximum at about 60 °K. These results show that the ZnS phosphors have a small trapping level. Samples with a hexagonal modification have a background extending down to 14 °K. This effect will be the subject of a further paper. At the present time it is assumed that the small levels are not connected with any activator, but depend only on the structure of the basic material.
There is 1 figure.

SUBMITTED: October 20, 1962

LEVSHIN, V.L.; TUNITSKAYA, V.F.

Luminescence of ZnS-Mn phosphors during excitation and its kinetics. Opt. i spektr. 9 no.2:223-232 Ag '60. (MIRA 13:8)
(Luminescence) (Phosphors)

LEVSHIN, V.L.; TUNITSKAYA, V.F.

Thermoluminescence and localization levels of ZnS-Mn phosphors.
Opt. i spektr. 8 no.5:663-671 My '60. (MIRA 13:9)
(Zinc sulfide) (Luminescence)

82949

S/051/60/008/005/011/027
E201/E491

24.3500

AUTHORS: Levshin, V.L. and Tunitskaya, V.F.

TITLE: Thermal De-excitation and Localization Levels of ZnS-Mn Phosphors

PERIODICAL: Optika i spektroskopiya, 1960, Vol.8, No.5, pp.663-671

TEXT: A series of ZnS-Mn phosphors was studied in a wide range of temperatures using exciting light of various wavelengths and intensities. The first part of this investigation is reported in the present paper which deals with the structure, population and thermal de-excitation (emptying) of capture levels in ZnS-Mn crystals of cubic modification. The effect of increasing manganese concentration on the spectrum of the levels was studied, as well as the effect of the excitation wavelengths on the population of the levels. The phosphors were prepared by heating a charge in a stream of nitrogen at 850°C for 30 min. Manganese was introduced in the form of MnCl and its initial concentration in the charge was from 10^{-6} to 3×10^{-2} g/g. About 40% of Mn was lost during firing. X-ray diffraction studies showed that all samples had sphalerite structure. Some of the results are presented in

Card 1/4

Thermal De-excitation and Localization Levels of ZnS-Mn Phosphors

Fig.1 to 7 and Tables 1 to 3. Fig.1 and 2 show the thermoluminescence (thermal de-excitation) curves for phosphors prepared at various temperatures (Fig.1) and with various amounts of manganese (Fig.2). Fig.3 and 4 and Tables 1 and 2 give the analysis of peaks I, II and III in thermoluminescence curves. Fig.5 and 6 show the light sums of blue, manganese and total luminescence as a function of the concentration of manganese. Fig.7 shows the thermoluminescence curves of ZnS (Fig.7a) and of ZnS with 10^{-3} g/g Mn (Fig.7b) excited with light of 312 (curves 1), 366 (curves 2) and 436 mμ (curves 3). The reduction of thermoluminescence light sums when the phosphors were excited with light of 436 mμ wavelength (compared with excitation using 312 and 366 mμ light) is illustrated in Table 3. The following conclusions were drawn from the results: (1) Manganese itself does not produce new localization levels which would appear in thermoluminescence peaks above 80°K. Only a small number of Mn ions remains near places where electrons are localized by oxygen and these Mn ions deepen the oxygen localization levels producing a new peak at -30°C.

Card 2/4

S/051/60/008/005/011/027
E201/E491

Thermal De-excitation and Localization Levels of ZnS-Mn Phosphors

Formation of this new peak is accompanied by a reduction of the oxygen peak at -90°C. (2) The quantum light sums of ZnS-Mn with up to 6 x 10^{-3} g/g Mn are practically independent of the concentration of Mn. In such phosphors radiationless transitions of electrons from localization levels do not occur on thermal de-excitation. (3) Light of 312 and 366 mμ wavelengths does not affect localized electrons and produces similar light sums on thermal de-excitation. If light of λ = 436 mμ is used, the light sums are reduced by factor of 3 and this reduction is stronger in the case of the blue luminescence compared than for orange luminescence; luminescence due to shallow levels is weakened to a greater extent than luminescence due to deep levels. (4) Increase of the amount of Mn reduces the depth of electron localization levels. (5) The profile of the high-temperature thermoluminescence peak suggests that only infrequently electrons are recaptured by localization levels during the process of thermoluminescence. Acknowledgments are made to A.V.Lavrov for preparation and analysis of the phosphors and to O.M.Agafonova for

82949
S/051/60/008/005/011/027
E201/E491

Thermal De-excitation and Localization Levels of ZnS-Mn Phosphors

her help in experiments. There are 7 figures, 3 tables and 13 references: 11 Soviet, 1 German and 1 Dutch.

SUBMITTED: July 25, 1959

4

Card 4/4

L 34871-65 EWT(l)/EWT(m)/EWA(t)/EWP(b) IJP(c) JD

ACCESSION NR: AP5005051 S/0051/65/018/002/0328/0330

AUTHOR: Levshin, V. L.; Tunitskaya, V. F.

TITLE: On some luminescence characteristics of ZnS-Mn phosphors in the 15--77K region

TOPIC TAGS: luminescence, thermoluminescence, zinc sulfide ceramic material, low temperature research

ABSTRACT: The authors have extended their earlier researches on the luminescent

Card 1/2

L 34871-65
ACCESSION NR: AP5005021

results have shown that the maximum of the first thermoluminescence peak shifts

not exist at all. If account is taken of the presence of a large number of shal-

should hold for all other luminors having a large number of shallow levels feeding

the phosphorescence [illegible]

ASSOCIATION: None

SUBMITTED: 27Mar64 ENCL: 00 SUB CODE: OP

NR REF SOV: 003 OTHER: 000

S/051/60/009/002/002/006
E201/E691

AUTHORS: Levshin, V.L. and Tunitskaya, V.F.

TITLE: The Luminescence Processes and their Kinetics in ZnS-Mn Phosphors During Excitation

PERIODICAL: Optika i spektroskopiya, 1960, Vol. 9, No. 2, pp. 223-232

TEXT: In an earlier paper (Ref 1) the authors dealt with thermal deexcitation and the origin of localization levels in ZnS-Mn phosphors. The present paper extends this work to luminescence of the same phosphors under excitation. The phosphors were in the form of ~3.7 μ thick layers (with grain diameter of ~1 μ) and were excited with 365 and 312 mμ lines from a mercury lamp; the quantum intensities of the lines were equalized with filters. The intensity of luminescence was measured with a photomultiplier FEU-32. The author studied the effect of temperature on the absorption spectra (Figs. 1, 2) and on the blue and orange luminescence of the phosphors (Figs. 3-6). The information obtained is used to discuss the processes of transformation of the excitation energy into blue luminescence, manganese luminescence and heat, as a function of the ambient temperature and the concentration of manganese.

Card 1/2

S/051/60/009/002/002/008
E201/E691

The Luminescence Processes and their Kinetics in ZnS-Mn Phosphors During Excitation

The mechanism of luminescence and quenching processes are dealt with and an energy diagram is proposed (Fig. 7) for the localization levels of electrons and holes. Acknowledgments are made to O.M. Agafonova for her help in measurements and to A.V. Lavrov for preparation of the phosphors. There are 7 figures, 1 table and 11 Soviet references.

SUBMITTED: December 17, 1959

Card 2/2

TUNITSKAYA, V. F.

USSR / Optics K

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10379

Author : Levshin, V.L., Tunitskaya, V.F., Cherepneva, A .A.
Inst : Physics Institute, Academy of Sciences, USSR
Title : Origin of Localization Levels in ZnS-Cu and Co Phosphors.

Orig Pub: Optika i spektrokopiya, 1956, 1, No 2, 255-263

Abstract: An investigation was made of the thermal glow (TG) of the phosphors ZnS, ZnS-Cu, ZnS-Co and ZnS-(Cu, Co) (annealing in H_2S and air for 30 minutes). In ZnS, the azure glow (bands at approximately 460 millimicrons) occurs only in the presence of a flux ($CaCl_2$). The peak of TG at -130° is due to the superstoichiometric zinc (for which favorable circumstances are produced by the chlorine), and the peak at -60° is ascribed to the oxygen. The green glow is ascribed to traces of copper. In ZnS-Cu, in addition to the zinc and oxygen peaks, there appear three new peaks, barely noticeable at -5 and 0° and a considerable one at +20°. These are ascribed to copper and appear to be the cause of the longer

Card : 1/2

USSR / Optics K

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10379

afterglow of ZnS-Cu at room temperature. ZnS-Co during the instant of excitation has an azure glow, weak at room temperature, intense at -186°. Introducing Co decreases sharply the light sums from the small local levels. Simultaneously there appear deeper levels in the region of +50°. Their structure is not clear because of the small light sums. In ZnS-(Cu, Co), the peaks at -130 and -60° are suppressed rapidly with increasing Co, and the copper peaks (-5,0, and +20°) are suppressed slowly, while new peaks appear at 50 and 80°.

Card : 2/2

GUDKOV, A.; BUSURIN, Ya.; IOFE, N.; PALKIN, G., kand. sel'khoz. nauk; TUNITSKIY, A., red.; KOROTAYEVA, D., tekhn. red.

[Manual on private livestock and poultry raising] Spravochnik po individual'nomu zhivotnovodstvu i ptitsevodstvu. Moskva, Izd-vo VTsSPS Profizdat, 1946. 182 p. (MIRA 14:8)
(Stock and stockbreeding) (Poultry)

TUNITSKIY, A.

Bryl', Yanka

"Dawn breaks in Zabolot'ye." Yanka Bryl', Reviewed by A. Tunitskiy, Mol. kolkh. 19, No. 9, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

TUNITSKIY, A.

White Russian Literature - History and Criticism

"Dawn breaks in Zabolot'ye." Ianka Bryl'. Reviewed by A. Tunitskiy. Mol.kolkh. 19 No. 9, 1952

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

TUNITSKIY, L.N., kandidat fiziko-matematicheskikh nauk; IGNASHKOV, A.I., kandidat fiziko-matematicheskikh nauk

Electric discharge lighting in an elongated tube. Svetotekhnika 1 no.2:23-26 Ap '55. (MLRA 8:9)

1. Moskovskiy elektrolampovyy zavod.
(Fluorescent lighting)

SKOBELEV,V.M., inzhener; TUNITSKIY,L.N., kandidat fiziko-matematicheskikh nauk

Investigation of factors determining the start in fluorescent lamps. Svetotekhnika 1 no.4:14-17 Ag '55. (MLRA 8:9)

1. Moskovskiy elektrolampovyy zavod.
(Fluorescent lamps)

PRIKHOT'KO, A.F.

24(7) 24.3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., A. Ya., Candidate of Physical and Mathematical Sciences.

Card 1/30

AVAILABLE: Library of Congress

TM/rj
4-22-59

Card 30/30

TUNITSKIY, N.N.

PHASE I BOOK EXPLOITATION SOV/1297

Vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po primeneniyu radioaktivnykh i stabil'nykh izotopov i izlucheniy v narodnom khozyaystve i nauke, Moscow, 1957

Polucheniye izotopov. Moshchnyye gamma-ustanovki. Radiometriya i dozimetriya; trudy konferentsii... (Isotope Production. High-energy Gamma-Radiation Facilities. Radiometry and Dosimetry; Transactions of the All-Union Conference on the Use of Radioactive and Stable Isotopes and Radiation in the National Economy and Science) Moscow, Izd-vo AN SSSR, 1958. 293 p. 5,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR; Glavnoye upravleniye po ispol'zovaniyu atomnoy energii SSSR.

Editorial Board: Frolov, Yu.S. (Resp. Ed.), Zhavoronkov, N.M. (Deputy Resp. Ed.), Aglintsev, K.K., Alekseyev, B.A., Bochkarev, V.V., Leshchinskiy, N.I., Malkov, T.P., Sinitsyn, V.I., and Popova, G.L. (Secretary); Tech. Ed.: Novichkov, N.D.

PURPOSE: This collection is published for scientists, technologists, persons engaged in medicine or medical research, and others concerned with the production and/or use of radioactive and stable isotopes and radiation.

COVERAGE: Thirty-eight reports are included in this collection under three main subject divisions: 1) production of isotopes 2) high-energy gamma-radiation facilities, and 3) radiometry and dosimetry.

TABLE OF CONTENTS:

PART I. PRODUCTION OF ISOTOPES

Card 2/12

Card 6/12

SOV/51-5-5-5/23

AUTHORS: Tatevskiy, V.M., Tunitskiy, L.N. and Novikov, M.M.

TITLE: Vibrational Constants and Dissociation Energy of the BeF Molecule (Kolebatel'nyye postoyannyye i energiya dissotsiatsii molekuly BeF)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 5, pp 520-529 (USSR)

ABSTRACT: The paper reports a new investigation of the vibrational structure of the $A^2\Pi$--$X^2\Sigma$ bands of BeF. The BeF spectrum was excited using gas-discharge tubes. Since the gas temperature is comparatively low in such tubes the rotational structure of the bands was weaker than in an arc and this reduced overlapping of bands and made it easier to observe new band edges. Two types of tubes were used in this work: one working under steady-state conditions (Fig 1) and the other for pulse excitation (Fig 2). Both tubes were filled with helium under 2-3 mm Hg pressure. BeF molecules were introduced into the discharge tubes by placing some BeF_2 in nickel boats inside the ubes. The tube used for steady-state discharges was U-shaped (1, in Fig 1) and had a quartz window (7, in Fig 1). The space around the electrodes (3, in Fig 1) was joined to the tube proper via liquid-hydrogen traps (4 and 5 in Fig 1). The tube was supplied from a 630 W transformer at 13 kV. The pulse-discharge source

Card 1/3

consisted of a straight tube (1, in Fig 2) with a fluorite window (2, in Fig 2). Its electrodes (4, in Fig 2) were supplied every second (for 0.02 sec) with a 600-700 V, 9 A pulse. The spectra were recorded using a DFS-3 spectrograph of 2 Å/mm dispersion and 144000 resolving power. An iron spectrum was used as a wavelength standard. Measurements were made with 0.5 cm^{-1} precision. The spectrum is shown in Fig 3. The measured band edges are given in Table 1. 48 new edges of Q_1-branches and 54 new edges of R_2 and R_1 branches were recorded. Table 2 gives the rotational constants ω_o, $\omega_o x_o$ and $\omega_o y_o$ of BeF taken from Refs 1, 3, 5, 6 and from the results reported in the present paper. Table 3 gives the values of v'_{max}, v''_{max}, $G'_o(v'_{max})$ and $G''_o(v''_{max})$ allowing for (columns I) and neglecting (columns II) the second coefficient of anharmonicity $\omega_o y_o$ of the BeF molecule. Table 4 gives the recommended, most reliable values of the spectroscopic constants of the BeF molecule

Card 2/3

SOV/51-5-5-5/23

Vibrational Constants and Dissociation Energy of the BeF Molecule

This table gives the dissociation energies of the $X^2\Sigma$ and $A^2\Pi$ states as 8 ± 0.5 and 3.9 ± 0.5 eV respectively. The author thanks L.V. Gurvich for his advice. There are 4 figures, 4 tables and 7 references.

SUBMITTED: December 6, 1957

Card 3/3 1. Beryllium fluoride--Spectrographic analysis 2. Molecules--Spectra 3. Molecules--Energy 4. Gas dishcarges--Applications

30541
S/051/60/008/06/002/024
E201/E691

5.4130

AUTHORS: Ovcharenko, I.Ye., Tunitskiy, L.N. and Yakutin, V.I.

TITLE: Analysis of the Fine Structure of the SiCl Molecular Bands

PERIODICAL: Optika i spektroskopiya, 1960, Vol. 8, Nr 6, pp 746-751 (USSR)

ABSTRACT: Four electron states ($X^2\Pi$, $B^2\Sigma$, $C^2\Delta$ and $D^2\Sigma$) of the SiCl molecule are known (Refs 1-4). The vibrational constants of these four states were reported by Jevons (Ref 4) and are listed in Table 1; the constants with question marks were considered unreliable by Jevons. The present paper reports new values of the rotational constants of the $B^2\Sigma$, $X^2\Pi_{3/2}$, $X^2\Pi_{1/2}$ states, derived from the rotational analysis of the (1, 0), (0, 0) and (0, 1) bands of the $B^2\Sigma \rightarrow X^2\Pi$ transition. The spectra of SiCl were excited in a quartz pulse-discharge tube, similar to one used earlier (Ref 5) and shown schematically in a figure on p 746. The tube was filled with a mixture of silicon tetrachloride and helium. The spectra were photographed with a DFS-3 spectrograph in the third order (dispersion of 0.57 Å/mm, resolving power of 432 000), and measured with a IZA-2 comparator (an iron arc spectrum was used as the wavelength standard, cf. Table 2).

Card 1/2

80541

S/051/60/008/06/002/024
E201/E691

Analysis of the Fine Structure of the SiCl Molecular Bands

For the $X^2\Pi_{1/2}$ state the following rotational constants were obtained: $B_1 = 0.2550$, $\alpha = 0.0016$, $D_e = 2.341 \times 10^{-7}$, $a = 0.004 \pm 0.001$ cm^{-1}; for $X^2\Pi_{3/2}$: $B_2 = 0.2556$, $\alpha = 0.0016$, $D_e = 2.355 \times 10^{-7}$ cm^{-1}; for $B^2\Sigma$: $B = 0.2782$, $\alpha = 0.0015$, $D_e = 1.752 \times 10^{-7}$ cm^{-1} (Table 3). The wavenumbers of the (0.1), (0.0), (1.0) lines of the $^2\Sigma \rightarrow {}^2\Pi_{1/2}$ transition were respectively 33662.0, 34193.6, 34892.2 cm^{-1}; for the $^2\Sigma \rightarrow {}^2\Pi_{3/2}$ they were 33455.7, 33987.1, 34685.8 cm^{-1}, respectively. There are 1 figure, 3 tables and 6 references, of which 2 are Soviet, 3 English and 1 German.

SUBMITTED: July 20, 1959

Card 2/2

S/051/60/008/06/003/024
E201/E691

5.4130

AUTHORS: Novikov, M.M. and Tunitskiy, L.N.

TITLE: The Vibrational Constants and the Dissociation Energy of the BeCl Molecule

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 6, pp 752-760 (USSR)

ABSTRACT: Two electron states ($X^2\Sigma$ and $A^2\Pi$) of the BeCl molecule are known. Fredrickson and Hogan (Ref 1) determined the vibrational constants, ω_e and $\omega_e x_e$ and estimated the rotational constants B'_o and B''_o. Fredrickson and Hogan (Ref 1) used linear approximation to obtain the dissociation energies of the $X^2\Sigma$ (4.33 eV) and $A^2\Pi$ (3.47 eV) states. Gaydon (Ref 3) corrected the former value to 3 ± 0.5 eV. The present paper reports a new investigation of the vibrational structure of the BeCl molecular band. A quartz pulse-discharge tube (Ref 4) was employed. The spectra (cf. a figure on p 753) were photographed with a DFS-3 spectrograph (dispersion of 2 Å/mm, resolving power of 144 000). The spectra were measured with a comparator IZA-2 (an iron arc spectrum was used as the wavelength standard). Thirty new Q_1 band edges and 43 new R_1 and R_2 band edges were recorded. More precise values (Table 6) of the

Card 1/2

S/051/60/008/06/003/022
E201/E691

The Vibrational Constants and the Dissociation Energy of the BeCl Molecule

vibrational constants ω_0 and $\omega_0 x_0$ of the $X^2\Sigma$ (841.3 and 5.11 cm^{-1} respectively) and the $A^2\Pi$ (816.0 and 5.06 cm^{-1} respectively) states were obtained. The second coefficients of anharmonicity $\omega_0 y_0$ were calculated for both states (0.0205 for $X^2\Sigma$ and -0.0368 cm^{-1} for $A^2\Pi$). The third coefficient of anharmonicity of the $X^2\Sigma$ state was found to be -0.0000582 cm^{-1}. Non-linear extrapolation yielded a new and more reliable value of the dissociation energy of BeCl; 5.9 ± 0.5 eV. (Table 6). In the 2610-2620 Å region new bands were discovered (Table 7) which are due to a transition from a hitherto unknown electron state. There are 1 figure, 6 tables and 6 references, of which 2 are Soviet, 2 English, 1 French and 1 translation from English into Russian.

SUBMITTED: September 21, 1959

Card 2/2

KUZYAKOV, Yu.Ya.; TATEVSKIY, V.M.; TUNITSKIY, L.N.

Rotational analysis of boron monoxide bands located in the vacuum ultraviolet region. Opt. i spektr. 9 no.2:156-161 Ag '60. (MIRA 13:8)

(Boron oxide--Spectra)

TUNITSKIY, L. N.

95

S/089/62/013/006/019/027
B102/B186

AUTHORS: G. T. and M. R.

TITLE: Nauchnaya konferentsiya Moskovskogo inshenerno-fizicheskogo instituta (Scientific Conference of the Moscow Engineering Physics Institute) 1962

PERIODICAL: Atomnaya energiya, v. 13, no. 6, 1962, 603 - 606

TEXT: The annual conference took place in May 1962 with more than 400 delegates participating. A review is given of these lectures that are assumed to be of interest for the readers of Atomnaya energiya. They are following: A. I. Leypunskiy, future of fast reactors; A. A. Vasil'yev, design of accelerators for superhigh energies; I. Ya. Pomeranchuk, analyticity, unitarity, and asymptotic behavior of strong interactions at high energies; A. B. Migdal, phenomenological theory for the many-body problem; Yu. D. Fiveyskiy, deceleration of medium-energy antiprotons in matter; Yu. M. Kogan, Ya. A. Iosilevskiy, theory of the Mössbauer effect; M. I. Ryazanov, theory of ionization losses in nonhomogeneous medium; Yu. B. Ivanov, A. A. Rukhadze, h-f conductivity of suboritical plasma;

Card 1/4

S/089/62/013/006/019/027
B102/B186

Nauchnaya konferentsiya...

Ye. Ye. Lovetskiy, A. A. Rukhadze, electromagnetic waves in nonhomogeneous plasma; Yu. D. Kotov, I. L. Rozental', the origin of fast cosmic muons; Yu. M. Ivanov, muon depolarization in solids; V. G. Varlamov, Yu. M. Grashin, B. A. Dolgoshein, V. G. Kirillov-Ugryumov, V. S. Roganov, A. V. Samoylov, μ^- capture by various nuclei; V. S. Demidov, V. G. Kirillov-Ugryumov, A. K. Ponosov, V. P. Protasov, F. M. Sergeyev, scattering of π^- mesons at 5 - 15 Mev in a propane bubble chamber; S. Ya. Nikitin, M. S. Aynutdinov, Ya. M. Selektor, S. M. Zombkovskiy, A. F. Grashin, muon production in π^-p interactions; B. A. Dolgoshein, spark chambers; N. G. Volkov, V. K. Lyapidevskiy, I. M. Obodovskiy, study of operation of a convection chamber; K. G. Finogenov, production of square voltage pulses of high amplitudes; G. N. Alekseakov, problems of color vision; V. K. Lyapidevskiy, relation between number of receivers and number of independent colors; Ye. M. Kudryavtsev, N. N. Sobolev, N. I. Tizengauzen, L. N. Tunitskiy, F. S. Fayzulov, determination of the moment of electron transition of oscillator forces and the widths of the Schuhman-Runge bands of molecular oxygen; B. Ye. Gavrilov, A. V. Zharikov, V. I. Rayko, decomposition of the volume charge of intense ion beams; Ye. A. Kramer-Ageyev, V. S. Troshin, measurement of neutron spectra; G. G. Doroshenko, new methods of fast-neutron recording; V. I. Ivanov, dosimetry terminology; R. M. Voronkov,

Card 2/4

KUDRYAVTSEV, Ye..M.; SOBOLEV, N.N.; TUNITSKIY, L.N.; FAYZULLOV, F.S.

Pyrometric study of the state of a gas behind a reflected shock wave. Trudy Fiz.inst. 18:159-200 '62. (MIRA 15:12)
(Pyrometry) (Shock waves) (Gas dynamics)

S/051/63/014/003/005/019
E039/E120

AUTHORS: Krindach, N.I., Kudryavtsev, Ye.M., Sobolev, N.N., Tunitskiy, L.N., and Fayzullov, F.S.

TITLE: Determination of the electronic transition moments of the Schumann-Runge band system in oxygen. I.

PERIODICAL: Optika i spektroskopiya, v.14, no.3, 1963, 351-361

TEXT: A method is developed for determining the square of matrix elements for electron transitions of molecules based on a measurement of the absorption in gases behind shock waves. The Schumann-Runge absorption bands for oxygen are obtained on a shock tube using helium as a working gas and equipped with apparatus for measuring temperature by the usual method of rotation of spectral lines; in this case by observing the resonance line of Ba II (λ = 4554 Å). An ionization probe is used for measuring the velocity of the front of the incident shock waves. The pulsed light source and the synchronizing circuit are described in detail. Spectra are recorded on ДФС-13 (DFS-13) and КС-55 (KS-55) spectrographs with glass and with quartz optics. By plotting the absorption index against wave number ν for the

Card 1/2

groups R(K)P(K - 4) and measuring the area under the curve, a value for the integral of the absorption index is obtained for lines of R and P form, from which is calculated the square of the moment for electronic transitions $|R_e^{n\,m}|^2$. The value of this integral obtained graphically agrees with the calculated value. These results and the analysis of possible errors will be examined in a later paper.
There are 10 figures.

SUBMITTED: May 18, 1962

KRINDACH, N.I.; SILIN-BEKCHURIN, I.A.; TUNITSKIY, L.N.; CHERKASOV, Ye.M.

High-frequency discharge in a neon-helium laser. Zhur. tekh. fiz. 35 no.9:1678-1684 S '65. (MIRA 18:10)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR, Moskva.

L 2983-66 EWA(k)/FBD/EWT(1)/EWT(m)/EPF(c)/EEC(k)-2/T/EWP(t)/EWP(k)/EWP(b)/
ACCESSION NR: AP5024051 EWA(m)-2/EWA(h) SCTB/ UR/0057/65/035/009/1678/1684
WG/JD LJP(c) 537.523.7

AUTHOR: Krindach, N. I.; Silin-Bekchurin, I. A.; Tunitskiy, L. N.; Cherkasov, Yu. M.

TITLE: Study of a high-frequency discharge in a neon-helium laser

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 35, no. 9, 1965, 1678-1684

TOPIC TAGS: gas laser, neon helium laser, hf discharge, plasma discharge

ABSTRACT: A new method is proposed for determining the current and voltage distribution along a high-frequency discharge and a study is made of the effect on laser operation of inhomogeneities along such a discharge. The method is based on the assumption that the voltage and current at any cross section of a discharge tube can be determined by the distance of that cross section from the end of the glowing portion of discharge. This assumption holds for any stationary discharge at any cross section of which electron rise due to ionization is a unity. The experiments were carried out by means of a gas laser (λ = 6328 Å) (see Fig. 1 of the Enclosure) which incorporated a fused-quartz discharge tube 1.7 cm long and 8 mm in diameter (internal) filled with a neon — helium mixture at a 10:1 ratio at a pressure of 0.8 mm Hg. Two plane-parallel quartz plates O_1 and O_2 were

Card 1/4

L 2983-66

ACCESSION NR: AP5024051

2

placed at the tube ends at Brewster's angle. The equivalent circuit of the discharge tube is shown in Fig. 2. The tube was placed between the two confocal dielectric mirrors M with a 2-m radius of curvature and an ~ 1% transmission around 6328 Å. The mirrors were adjusted by means of an AKT-400 collimator. The discharge tube was fed by a 30-Mc frequency from an h-f oscillator, whose voltage was supplied to 8-cm electrodes E_1 and E_2, while electrodes E_3, E_4, and E_5 (2.5 cm each) were grounded. The oscillator was L-coupled to the discharge tube and the currents I_1 and I_2 and voltages V_1 and V_2 were measured by T-22 hot-wire ammeters and S-95 electrostatic voltmeters (4-pf input capacitance) respectively. The output energy was measured by means of a calibrated thermopile. The capacity of the discharge tube, varied by a movable ground rod R placed above the tube, was determined by its distance from R. In the experiments a discharge with a maximum length of 35 cm was studied. The experimental method and results are discussed in detail and indicate good agreement with computed data. Orig. art. has: 1 table and 7 figures.

[YK]

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva AN SSSR, Moscow (Physics Institute, AN SSSR)

44

SUBMITTED: 18Jan65 ENCL: 02 SUB CODE: EC

NO REF SOV: 004 OTHER: 006 ATD PRESS: 4110

L 2983-66

ACCESSION NR: AP5024051

ENCLOSURE: 01

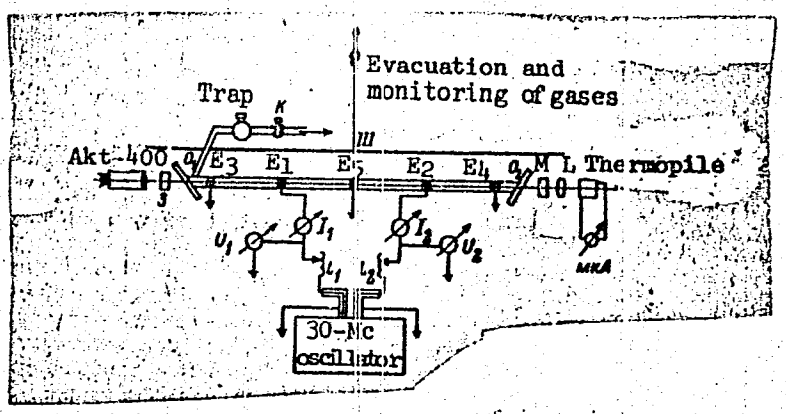


Fig. 1. Schematic of the laser

Card 3/4

L 2983-66

ACCESSION NR: AP5024051 ENCLOSURE: 02

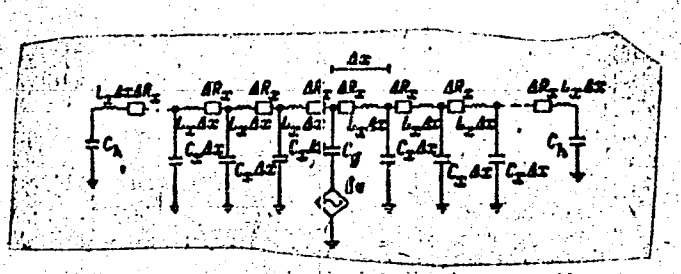


Fig. 2. Equivalent circuit of the discharge tube

BVK
Card 4/4

E - TUNITSKIY, L.N.

L 46301-65 EWT(1) IJP(c)

ACCESSION NR: AR5012225 UR/0058/65/000/003/D013/D013

SOURCE: Ref. zh. Fizika, Abs. 3D81

AUTHOR: Sobolev, N.N.; Antropov, Ye.T.; Gippius, Ye.F.; Dronov, A. P.; Krindach, N. I.; Kudryavtsev, Ye.M.; Pechenov, A.N.; Sviridov, A.G.; Tunitskiy, L.N.; Fayzullov, F.S.; Cheremisinov, V. P.

TITLE: Experimental determination of electronic oscillator strengths of diatomic molecules

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 64-81

TOPIC TAGS: oscillator strength, electron oscillator, diatomic molecule, shock wave, oxygen, nitric oxide, cyan, electronic spectrum

TRANSLATION: To determine the oscillator strengths of electronic transitions of diatomic molecules, an experimental method was developed, based on the measurement of the absorption of gas behind a shock wave reflected from the end of a shock tube. By varying the velocity of the incident shock wave and by calculating the state of the gas behind the shock wave, it is possible to determine the temperature and the concentration that the molecules behind the reflected

Card 1/2

L 46301-65

ACCESSION NR: AR5012225

shock wave must have to permit determination of the oscillator strengths from the measured absorption. The theoretically obtained temperature was monitored by two experimental methods. A method was also developed for determining the oscillator strengths from the study of the gas behind the shock wave; these strengths were determined for the Schumann-Runge bands of oxygen, the beta and gamma systems of nitric oxide, the violet band system of CN, and the C_2 Swan bands.

SUB CODE: NP,,ME ENCL: 00

Card 2/2

L 64720-65
ACCESSION NR: AR5012274 UR/0058/65/000/003/D046/D046

36

SOURCE: Ref. zh. Fizika, Abs. 3D348

AUTHOR: Trindade, N. I.; Sobolev, N. N.; Zuritskiy, L. N.

TITLE: [illegible]

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 304-312

TOPIC TAGS: [illegible] spectrum, absorption spectrum, molecular spectrum, spectrographic analysis, absorption coefficient

TRANSLATION: A method is developed for determining the true values of the half-[illegible] spectral line and the integral [illegible] of the [illegible] the spectral instrument. [illegible] where there is incomplete resolution of the rotational structure. This method [illegible] also [illegible] to estimate the error in the integral absorption index which is caused by [illegible] a contour with [illegible] tour which is defined in an infinite interval.

ENCL: 00

SUB CODE: OP
Card 1/1 0V.C.

KRINDACH, N.I.; SOBOLEV, N.N.; TUNITSKIY, L.N.

Determination of the electron transition moments of the Schumann-Runge bands of the oxygen molecule. Part 3. Opt. i spektr. 15 no.5:601-608 N '63. (MIRA 16:12)

TUNITSKIY, L. N.

Opredeleniye momentov elektronnogo perekhoda sistem polos Shumana-Runge kisloroda

report submitted for the VIIth European Congress on Molecular Spectroscopy, Budapest, 22-27 Jul 1963.

KRINDACH, N.I.; SOBOLEV, N.N.; TUNITSKIY, L.N.

Determining the electron transition moments of the Schumann-Runge bands for the oxygen molecule. Part. 2. Opt. i spektr. 15 no.3:298-305 S '63. (MIRA 16:10)

S/051/60/009/002/007/013/XX
E201/E491

AUTHORS: Kuzyakov, Yu.Ya., Tatevskiy, V.M. and Tunitskiy, L.N.

TITLE: A Rotational Analysis of Boron Monoxide Bands Lying in the Vacuum Ultraviolet Region

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.2, pp.156-161

TEXT: Chretien (Ref.1) studied the 1300 to 2100 Å spectra of discharges in BF_3 with a vacuum spectrograph fitted with a grating of 1 m radius and 8.3 Å/mm dispersion. Chretien found several bands which he ascribed to the BO molecule; the band edges, interpretations and relative intensities are given in Table 1. Later, Zelenskaya and Tunitskiy (Ref.2) reported a discharge spectrum of BF_3 recorded in the vacuum ultraviolet region with a spectrograph ДФС-5 (DFS-5) with a resolving power of 120000 and a dispersion of 2.7 Å/mm. Zelenskaya and Tunitskiy wrongly ascribed the bands in the 1700 to 1900 Å region to a hydrogen compound of boron. More detailed studies showed that Chretien's interpretation was correct. In the present paper the authors analyse the fine structure of the (0, 0) and (1, 0) bands (Chretien's nomenclature). A study of the isotopic shift in the BO bands, carried out in the authors' laboratory by A.A.Mal'tsev and V.M.Tatevskiy showed that Chretien's interpretation should be corrected so that his (0, 0) and

Card 1/2

S/051/60/009/002/007/013/XX
E201/E491

A Rotational Analysis of Boron Monoxide Bands Lying in the Vacuum Ultraviolet Region

(1, 0) bands become (1, 0) and (2, 0) respectively. These two bands lie between 1300 and 2100 Å and are due to $^2\Pi \rightarrow X^2\Sigma$ transitions of the BO molecule; interpretation of the (1, 0) band is given in Table 2 and of the (2, 0) band in Table 3. The rotational constants of the $^2\Pi$ state were also determined (Table 4). There are 4 tables and 7 references: 2 Soviet, 3 English, 1 Swiss and 1 translation from English into Russian.

SUBMITTED: November 23, 1959

Card 2/2

24,3400 also 2308

83636
S/081/60/000/015/002/014
A006/A001

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 15, p. 15, # 60233

AUTHORS: Kutyrkin, V.N., Peyzulayev, Sh.I., Tunitskiy, L.N.

TITLE: Investigation of the "BeF" Spectrum

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1957, No. 3 (8), pp. 486-489

TEXT: A ДФС -3 (DFS-3) spectrograph (2A/mm dispersion) was used to investigate the BeF emission spectrum in the 2800-3400 A range ($^2\Pi$- $^2\Sigma$ transition) in a discharge tube heated to 750-800°C. A reduction of the rotational structure to K≈15-18 as compared to the arc spectrum (K > 55), made it possible to obtain a considerably greater number of band edges than in operating with an arc. Wave numbers of 1-1 band lines are given. The presence of lines with K = 0 and 1 in the branch show that the BeF molecule terms are inverted ones. See also RZhKhim, 1959, No. 8, # 26114. X

A. Mal'tsev

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

83637

S/081/60/000/015/003/014
A006/A001

5.2400A

Translation from: Referativnyy zhurnal, Khimiya, 1960, No. 15, p. 15, # 60234

AUTHORS: Zelenskaya, L.G., Tunitskiy, L.N.

TITLE: Investigation of a Discharge Spectrum in BF_3 in Vacuum Ultraviolet

PERIODICAL: Fiz. sb. L'vovsk. un-t, 1957, No. 3 (8), pp. 489-493

TEXT: АДФС-5 (DFS-5) vacuum spectrograph (2.7 A/mm dispersion) was used to investigate the discharge emission spectrum in BF_3. The rotational structure of two bands in the 1700-1900A range was determined. The bands must according to Cretenin's data (Cretenin, Helv. phys. acta, 1950, Vol. 23, p. 259) belong to the $^2\Pi - ^2\Sigma$ transition of the BO molecule, appearing as a contamination. As a result of rotational analysis it is shown that it is probably wrong to relate these bands to the BO molecule, and they are related to the $^1\Pi - ^1\Pi$ or $^2\Sigma - ^2\Sigma$ transition of some hydrogen compound. Rotational constants B' and B'' $\approx$ 8.7 cm^{-1}A are determined.

A. Mal'tsev

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

TUNITSKIY, N. (Odessa)

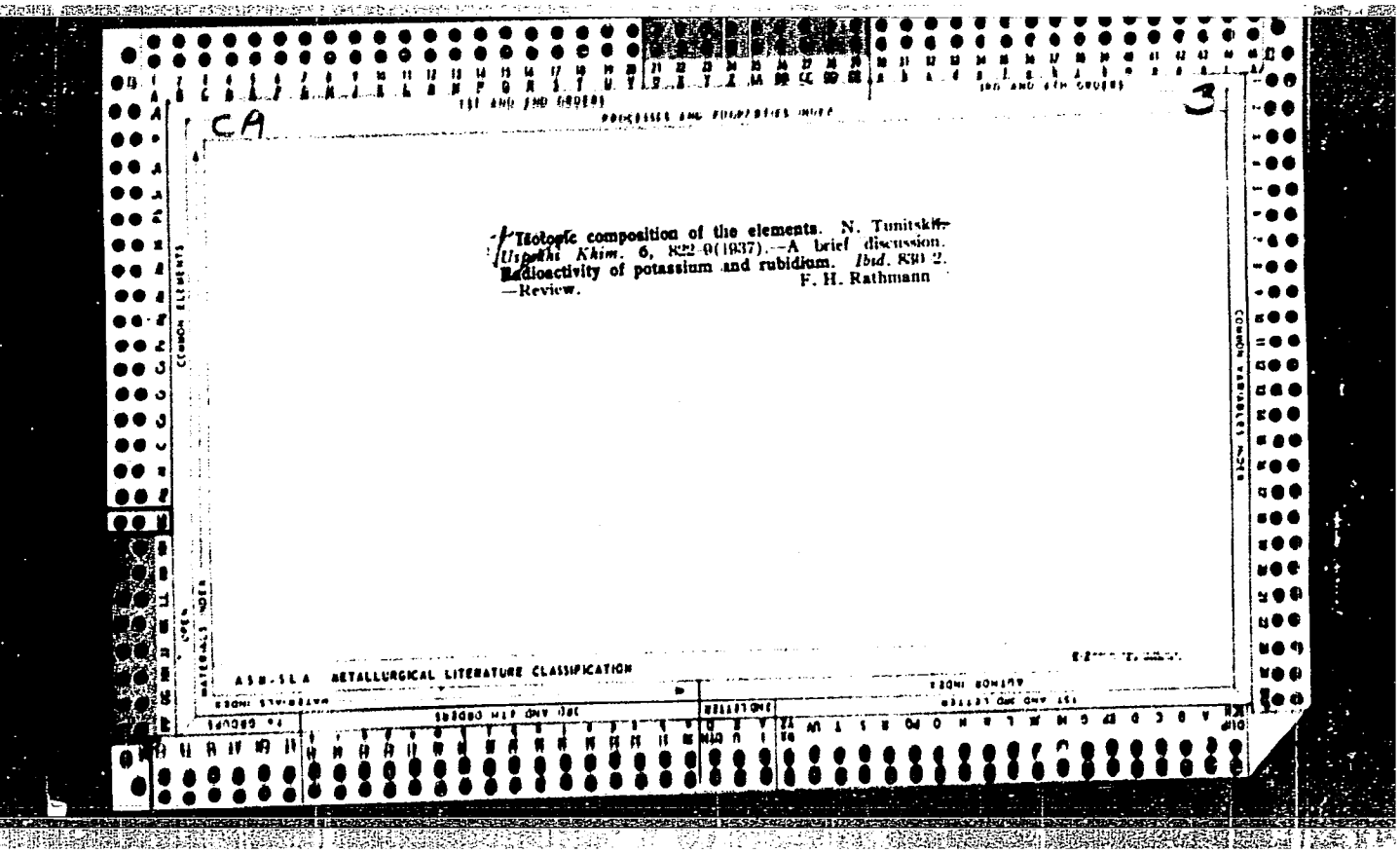
First Soviet jet fighter. Kryl.rod. 10 no.3:28 Mr '59. (MIRA 12:4)

(Airplanes--Models)

SUMIN, L.V.; GUB'YEV, M.V.; TUNITSKIY, N.N.

Average time of formation of fragment ions from n-hexane. Kin. i kat. 5 no.6:961-967 N-D '64. (MIRA 18:3)

1. Nauchno-issledovatel'skiy Fiziko-khimicheskiy institut imeni Karpova, Moskva.



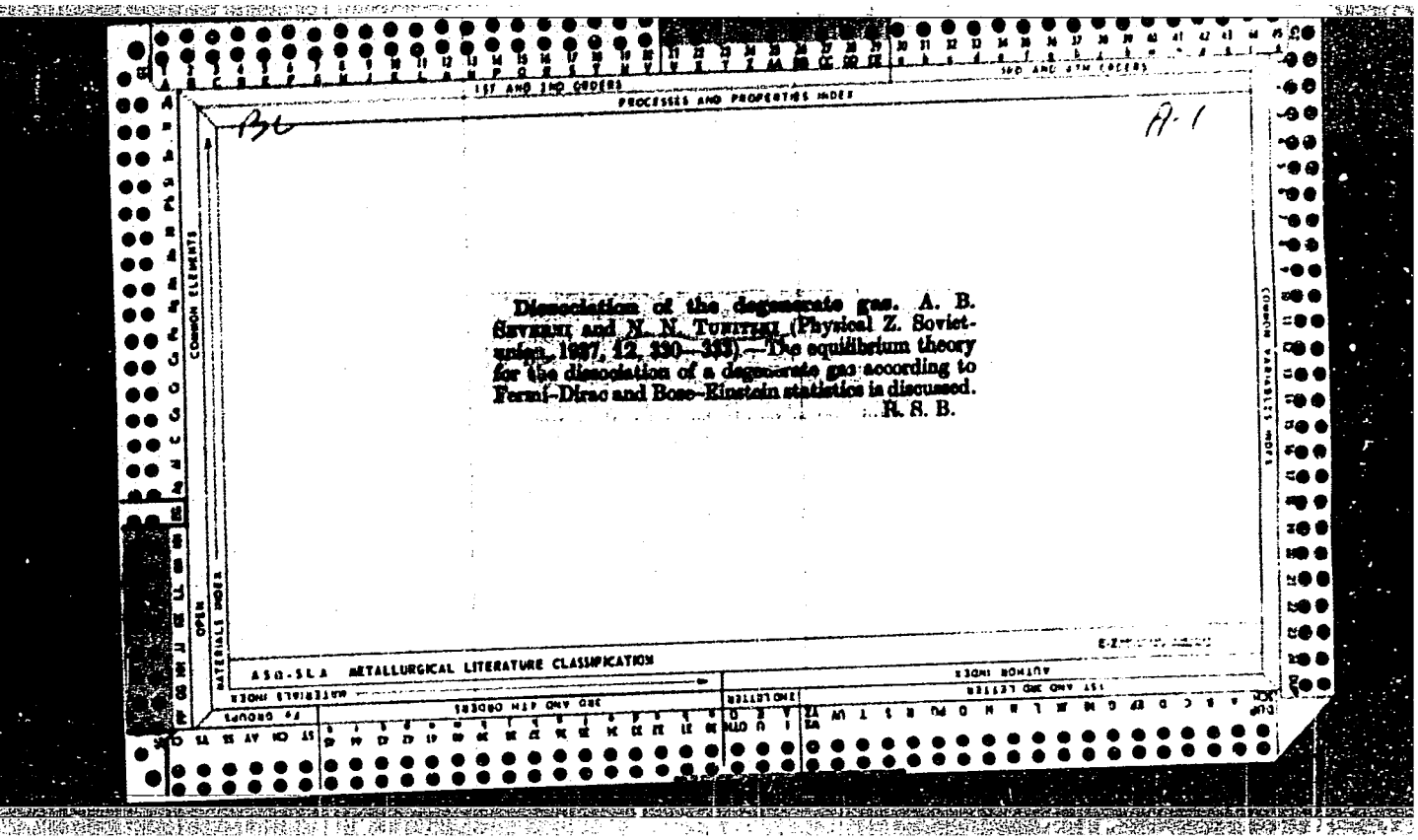
CA

3

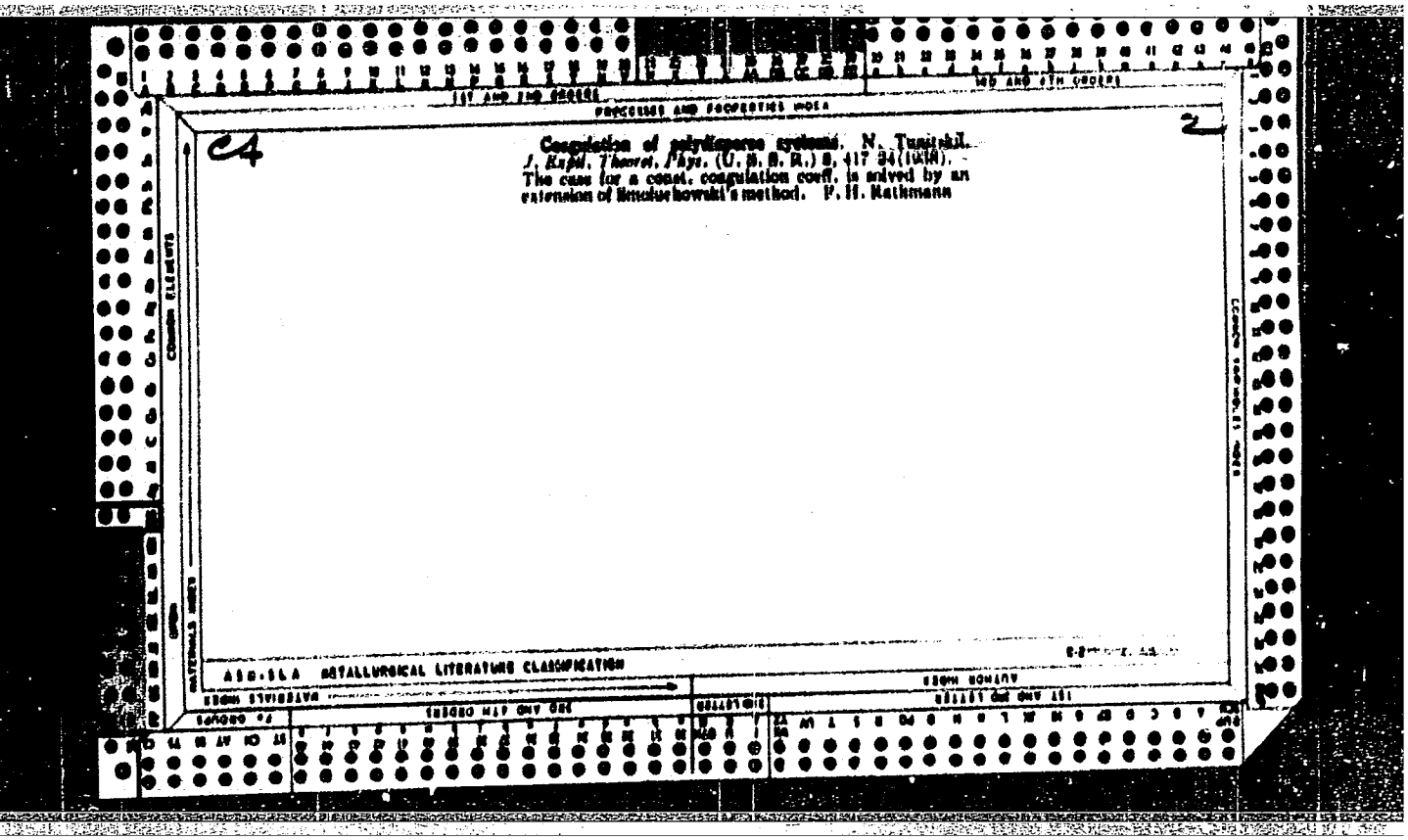
Isotopic composition of the elements. N. Tunitskii. *Uspekhi Khim.* 6, 822–9(1937).—A brief discussion. Radioactivity of potassium and rubidium. *Ibid.* 830–2. —Review.

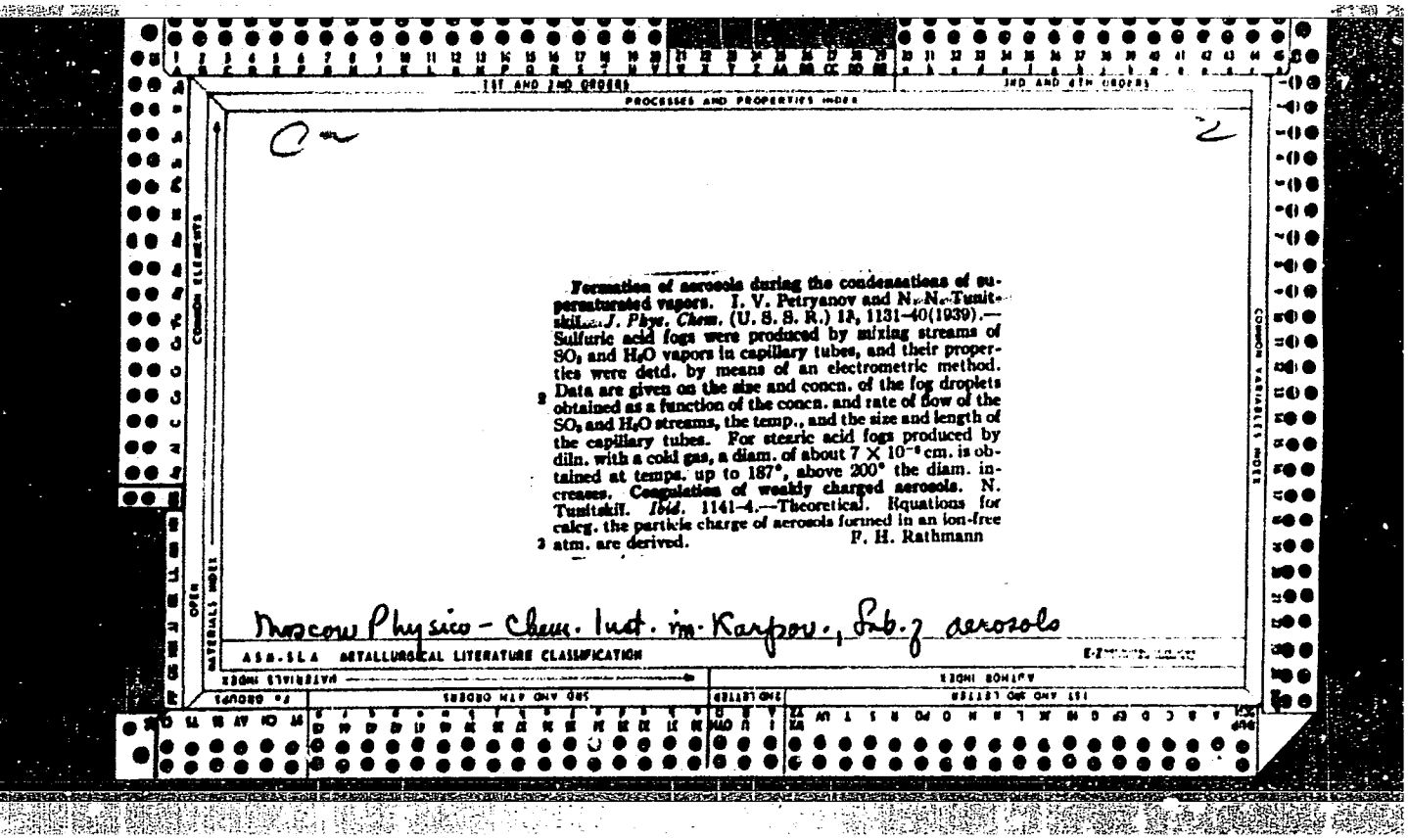
F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Dissociation of the degenerate gas. A. B. Severnyi and N. N. Tunitskii (Physical Z. Soviet-union, 1937, 12, 330–343).—The equilibrium theory for the dissociation of a degenerate gas according to Fermi-Dirac and Bose-Einstein statistics is discussed.
R. S. B.





Formation of aerosols during the condensations of supersaturated vapors. I. V. Petryanov and N. N. Tunitskii. *J. Phys. Chem.* (U. S. S. R.) 13, 1131–40(1939).—Sulfuric acid fogs were produced by mixing streams of SO_3 and H_2O vapors in capillary tubes, and their properties were detd. by means of an electrometric method. Data are given on the size and concn. of the fog droplets obtained as a function of the concn. and rate of flow of the SO_3 and H_2O streams, the temp., and the size and length of the capillary tubes. For stearic acid fogs produced by diln. with a cold gas, a diam. of about 7×10^{-6} cm. is obtained at temps. up to 187°, above 200° the diam. increases. Coagulation of weakly charged aerosols. N. Tunitskii. *Ibid.* 1141–4.—Theoretical. Equations for calcg. the particle charge of aerosols formed in an ion-free atm. are derived. F. H. Rathmann

Moscow Physico-Chem. Inst. im. Karpov., Sb. z aerosols

TUNITSKIY4N8

600

1. TUNITSKIY, N.

2. USSR (600)

"The Coagulation of Weakly (slabo) Charged Aerosols", Zhur. Fiz. Khim, 13, No. 8, 1939. Moscow, Physico-Chemical Institute imeni L. Ya. Karpov, Lab. of Aerosols. Received 27 Feb 1939.

9. [redacted] Report U-1615, 3 Jan 1952.

BYKOV, R.I.; MAL'TSEVA, A.K.; TURANOV, V.A.; GAVRILOV, V.P.

Regularities in the distribution of oil and gas fields in the Jurassic sediments of the central part of the Turan Plateau. Trudy MINKHiGP no.43:125-134 '63. (MIRA 17:4)

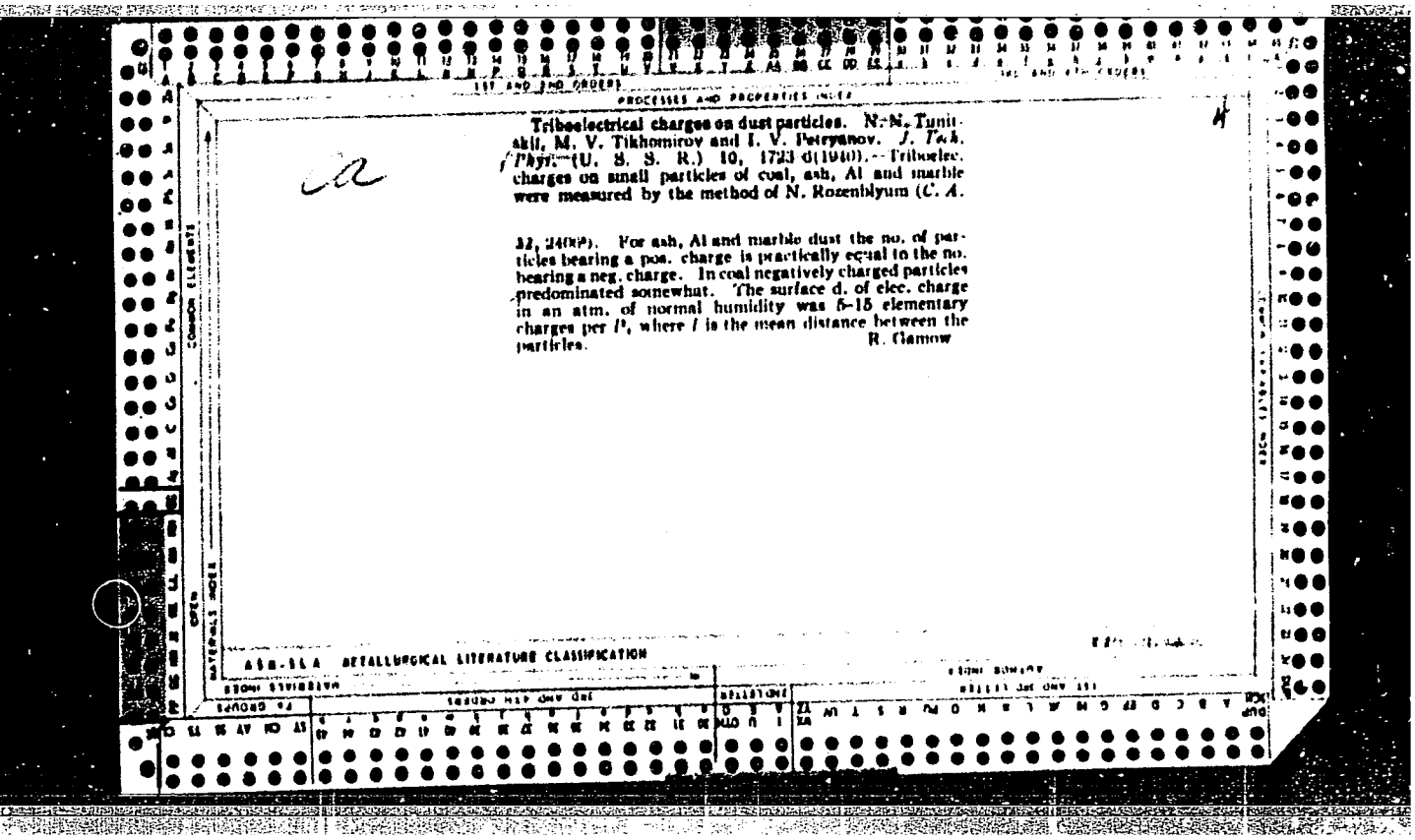
TURBIN, N. V.; MIRONENKO, A. V.

"The genetic blocking of alkaloid biosynthesis in varieties of fodder lupin."

report submitted for 10th Intl Botanical Cong, Edinburgn, 3-12 Aug 64.

xepoxkxxmmm

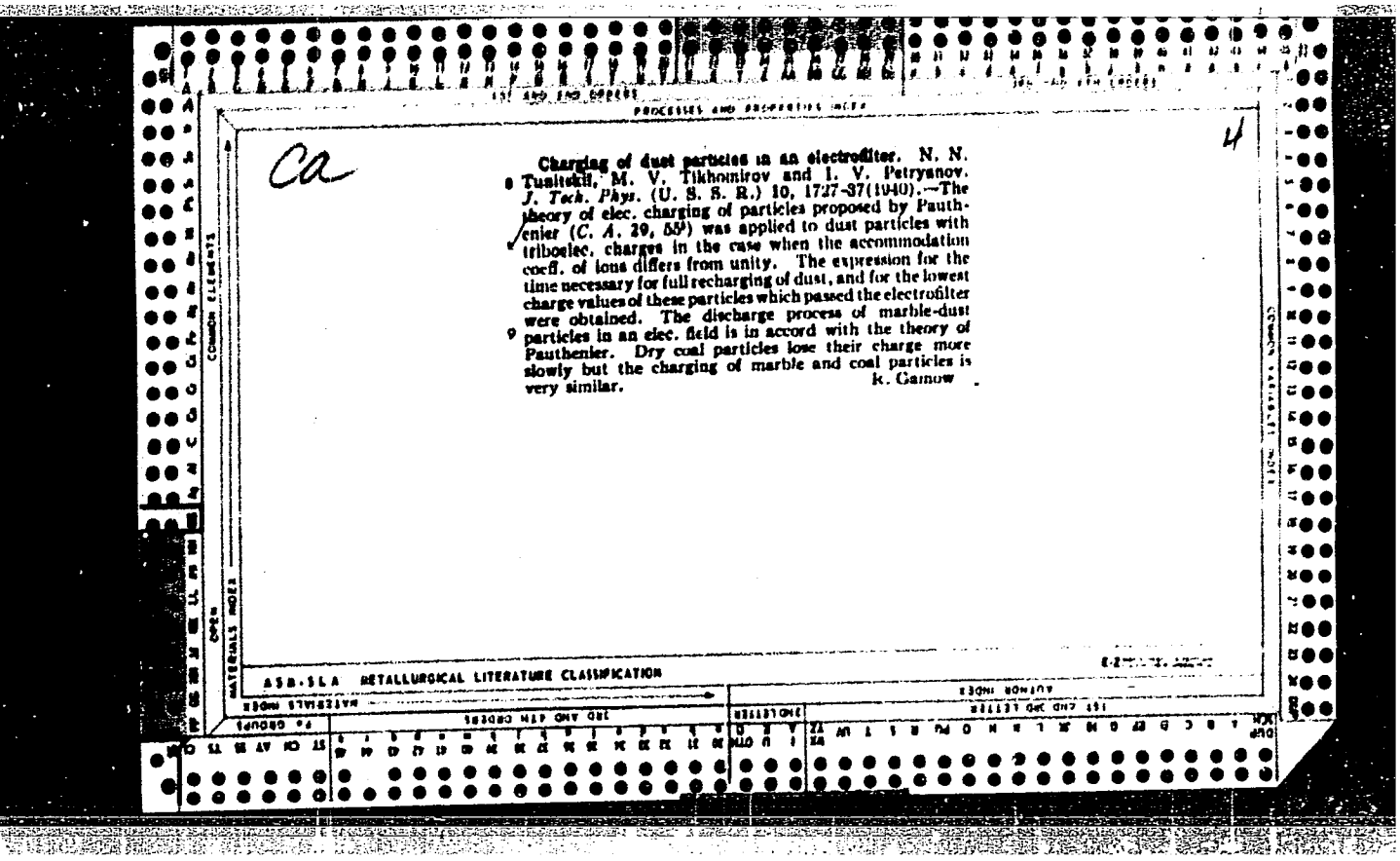
AS BSSR, Minsk.



Triboelectrical charges on dust particles. N. N. Tunitskii, M. V. Tikhomirov and I. V. Peryanov. *J. Tech. Phys.* (U. S. S. R.) 10, 1723-6(1940).—Triboelec. charges on small particles of coal, ash, Al and marble were measured by the method of N. Rozenblyum (*C. A.* 32, 2402⁸). For ash, Al and marble dust the no. of particles bearing a pos. charge is practically equal to the no. bearing a neg. charge. In coal negatively charged particles predominated somewhat. The surface d. of elec. charge in an atm. of normal humidity was 5–15 elementary charges per l^2, where l is the mean distance between the particles.

R. Gamow

A58-51A METALLURGICAL LITERATURE CLASSIFICATION



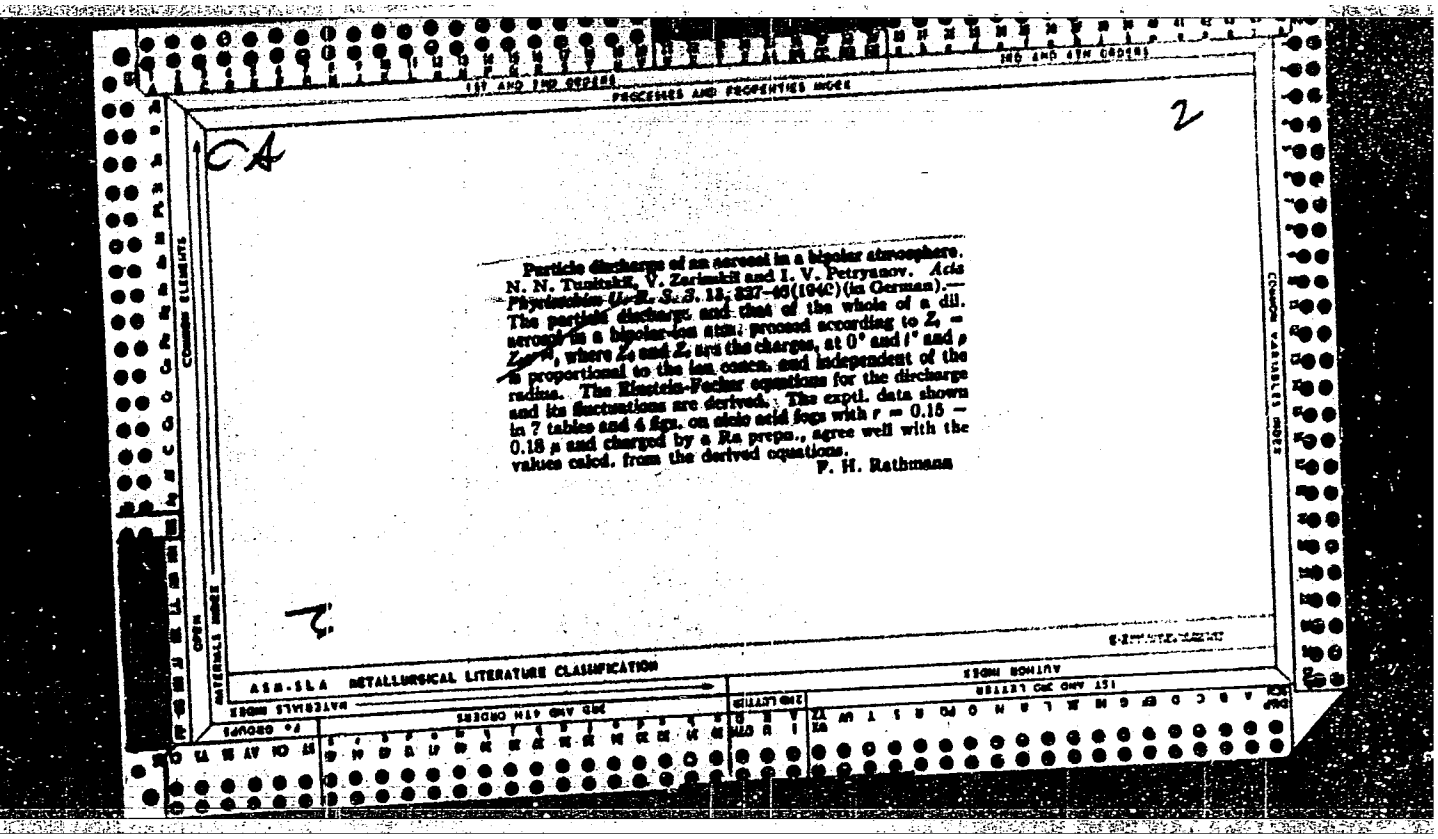
Ca

4

Charging of dust particles in an electrofilter. N. N. Tunitskii, M. V. Tikhomirov and I. V. Petryanov. *J. Tech. Phys.* (U. S. S. R.) 10, 1727-37(1940).—The theory of elec. charging of particles proposed by Pauthenier (*C. A.* 29, 55[9]) was applied to dust particles with triboelec. charges in the case when the accommodation coeff. of ions differs from unity. The expression for the time necessary for full recharging of dust, and for the lowest charge values of these particles which passed the electrofilter were obtained. The discharge process of marble-dust particles in an elec. field is in accord with the theory of Pauthenier. Dry coal particles lose their charge more slowly but the charging of marble and coal particles is very similar.

K. Garnow

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



Particle discharge of an aerosol in a bipolar atmosphere. N. N. Tunitskiĭ, V. Zorinskiĭ and I. V. Petryanov. *Acta Physicochim. (U.R.S.S.)* 18, 327–46(1943)(in German).—The particle discharge, and that of the whole of a dil. aerosol in a bipolar-ion atm., proceed according to $Z_t = Z_0 e^{-\rho t}$, where Z_0 and Z_t are the charges, at 0° and t° and ρ is proportional to the ion concn. and independent of the radius. The Einstein-Fuchs equations for the discharge and its fluctuations are derived. The expt. data shown in 7 tables and 4 figs. on oleic acid fogs with $r = 0.15 - 0.18$ μ and charged by a Ra prepn., agree well with the values calcd. from the derived equations.

P. H. Rathmann

TUNITSKIY, N.; ZARINSKIY, V.; PETRIANOV, A.

Physico-Chemical Institute imeni L. Ya. Karpov, (-1940-).

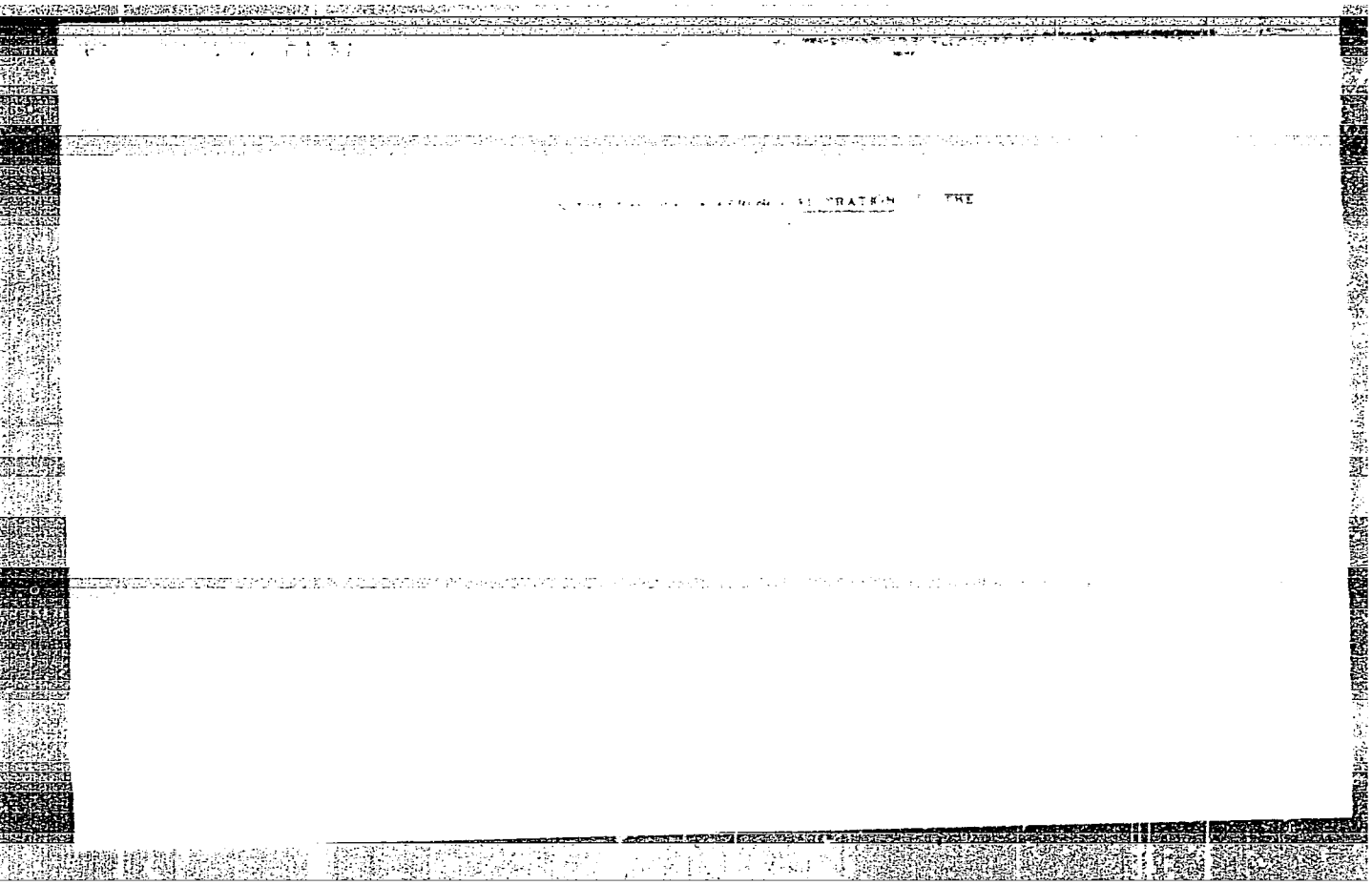
"The Charging of Aerosols in a Bipole-Ionized Atmosphere."

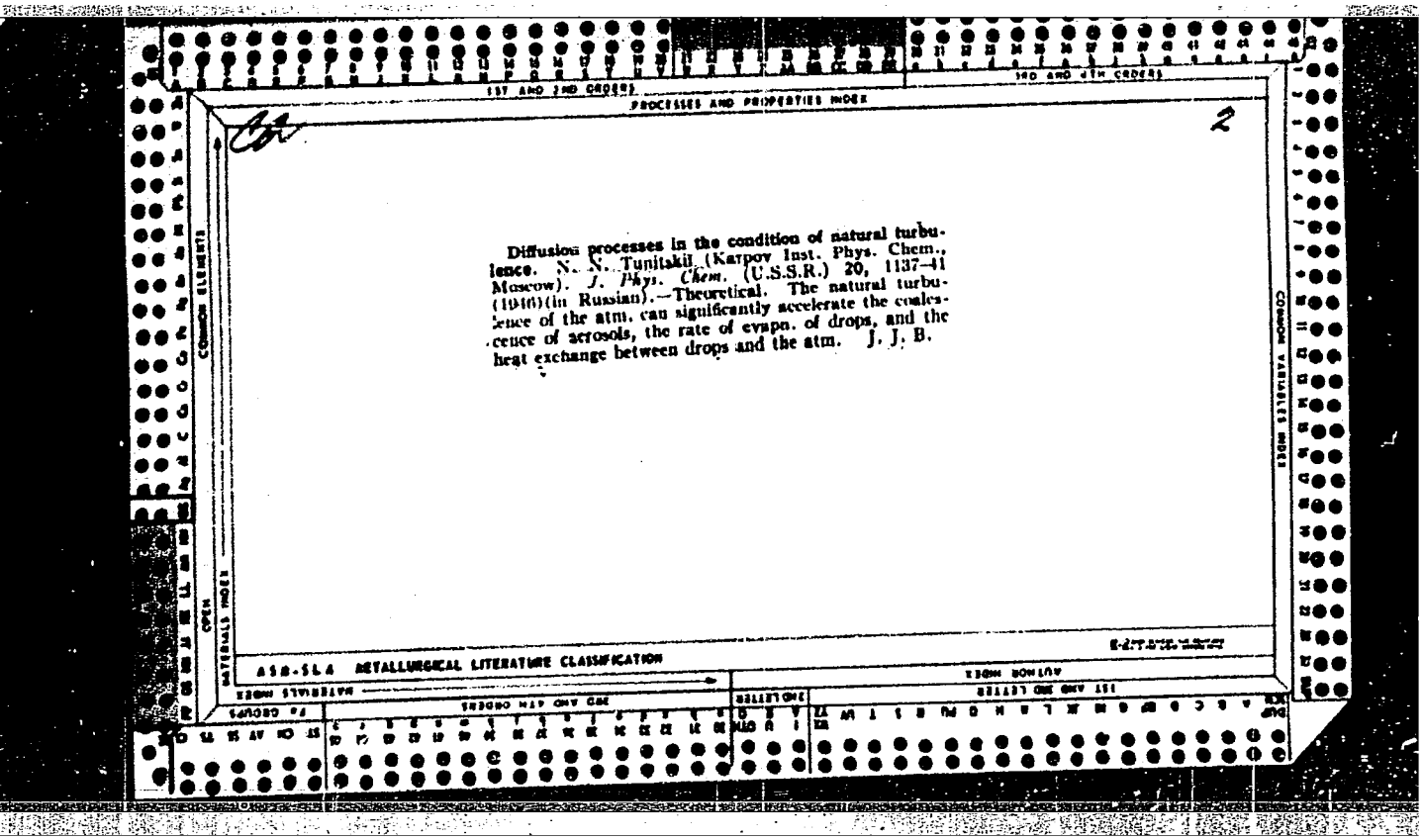
Zhur. Fiz. Khim., Vol. 14, No. 4, 1940.

Condensation of supersaturated vapours. N. Tunitski (*J. Phys. Chem. Russ.*, 1941, **15**, 1061—1071).—The rate of condensation of H_2O vapour at adiabatic expansion is calc. The results agree with the experimental data by Wilson (cf. A., 1898, ii, 372) but disagree with those by Barus (*Ann. Physik*, 1907, **24**, 225) and Andrén (A., 1917, ii, 192). J. J. B.

Abr. libo TUNITSKIY, N N.

Influence of van der Waals forces on coagulation of aerosols. M. V. Tikhomirov, N. N. Tunitzkii, and J. B. Petrjanov (Acta Physicochim. U.R.S.S., 1949, 17, 185–190). An equation is derived which shows that the rate of coagulation of an aerosol is determined uniquely by the mean vals. of R, $1/R$, and $1/R^2$, where R is the radius of the particles. On taking into account the interaction between the particles, *i.e.*, the van der Waals forces, the coagulation const. is increased by a factor γ, which is independent of R but is determined by the const. in the van der Waals forces equation. Experiments with mists of mineral oil, tritolyl phosphate, and H_2SO_4 give γ vals. of 1·25, 1·22, and 1·30, respectively. J. F. H





Diffusion processes in the condition of natural turbulence. N. N. Tunitskii (Karpov Inst. Phys. Chem., Moscow). *J. Phys. Chem.* (U.S.S.R.) 20, 1137–41 (1946)(in Russian).—Theoretical. The natural turbulence of the atm. can significantly accelerate the coalescence of aerosols, the rate of evapn. of drops, and the heat exchange between drops and the atm. J. J. B.

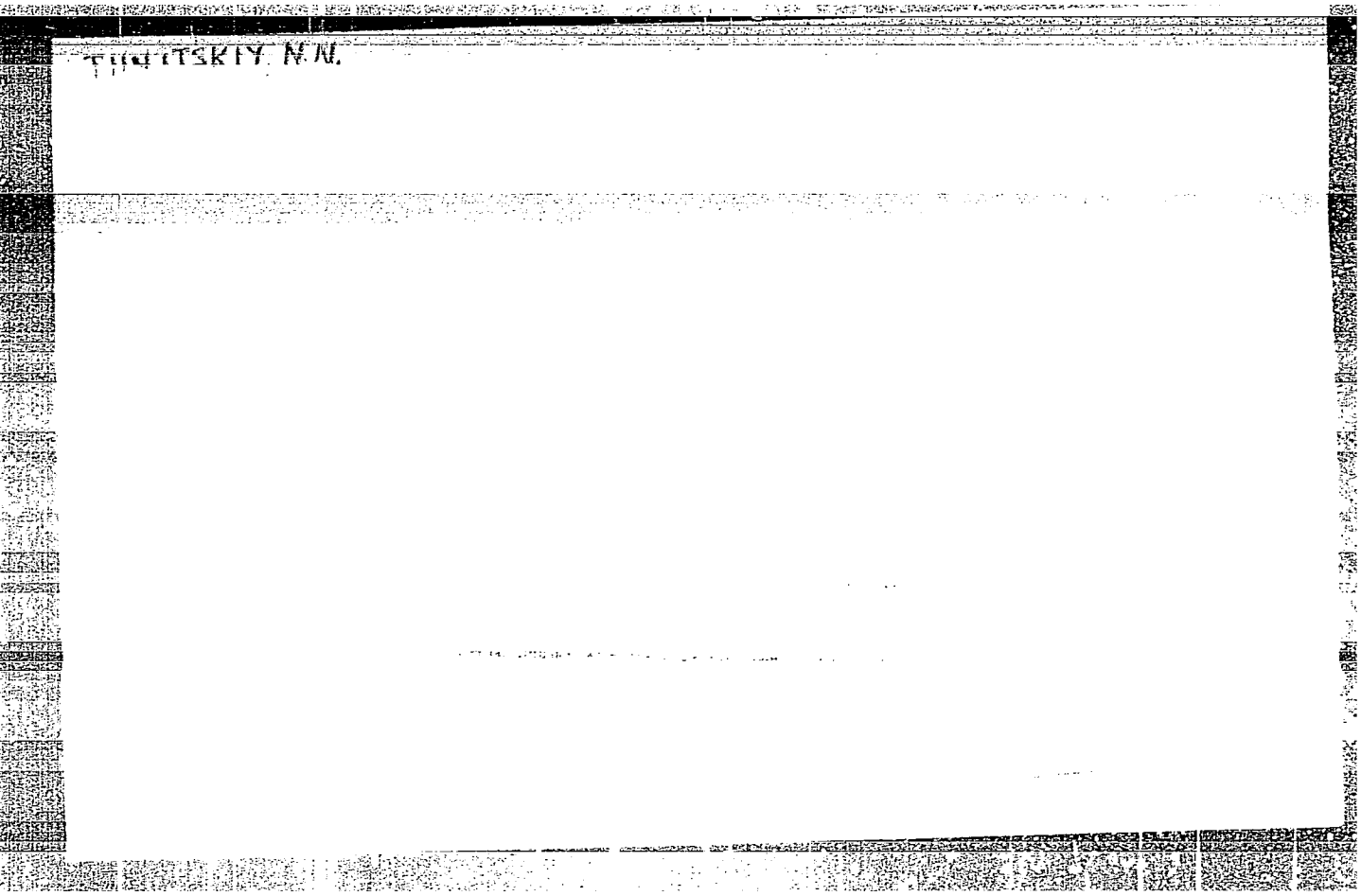
A

Dynamic theory of adsorption and chromatography. I. Broadening of chromatographic bands and adsorption fronts. N. N. Tunitskii and B. P. Cherneva (Karpov Phys. Chem. Inst., Moscow). *Zhur. Fiz. Khim.* 24, 1350-60(1950). (cf. Radushkevich, *Doklady Akad. Nauk* 57, 5, 471(1947)).—Chromatographic processes are treated statistically. A sharp adsorption front is investigated because of the fluctuation of the lifetime of the particles in the adsorbed state. Two relations are then derived: $(x - \bar{x})^2 = 2Kt$ (I) and $(t - \bar{t})^2 = 2Bx$, which are valid both when diffusion in the liquid or the adsorption is rate-detg. (I) and when the limiting step is the diffusion through the adsorbent particles (II). For I, $K = v^2/\beta'$, where v is the velocity of the liquid relative to a fixed cross section of the column, $\beta = \beta_1(1 - \alpha)$, α = relative vol. occupied by the liquid, $\beta' = \gamma(1 - \alpha)$ with α = relative vol. occupied by the liquid, γ = adsorption coeff., β_1 = kinetic coeff. A linear sorption isotherm is assumed throughout. For II, $\epsilon = \pi^2 D/3l^2$, where D is the diffusion coeff. inside the adsorbent and $2l$ is the thickness of the adsorbent particles. Also for II, $B = \beta'/3Dv$. By taking into account longitudinal diffusion and hydrodynamic factors, 2 additional terms are obtained in the expression for K, and (I) becomes: $(\Delta x)^2 = [(\pi^2/3l^2)D + \alpha D_1 + Cv]t$, where D_1 is the diffusion coeff. in the flowing liquid, α = const., C = f (Reynolds no.) = const. if the flow is laminar. Exptl. data obtained with a cation exchanger confirm the theory. First, the column is washed with 20 cc. of a 0.1 N soln. (40% NaCl and 60% HCl). Then the band is displaced with a 0.1 N HCl soln. passed at a given rate, and samples (12 cc.) are taken and analyzed (Mohr method of NaCl). The above formulas give $(\Delta V)^2/V = Cv$ (2). But $(\Delta V)^2/\bar{V} = [(\overline{\Delta N})^2/\bar{N}]\omega$ with $\bar{N} = \Sigma N_x v/\Sigma C_s$ and $(\overline{\Delta N})^2 = [\Sigma(N - \bar{N})^2 C_x v/\Sigma C_s]$. N = no. of sample, ω = its vol., C_x = its NaCl concn. A straight line is obtained in a diagram $(\Delta V)^2/V$ against v in the range $0.3 < v < 2$ cc./min., as predicted by (2). The theory also predicts that the distribution function $\Pi(x, t)$ will be Gaussian at least for sufficiently large values of t. This is verified by plotting $[\log(100/c)]^{1/2}$ against $\Delta N = N - N_1$; a straight line is obtained, as expected for a Gaussian distribution.

Michel Boudart

TUNITSKIY, N.N.

Theory of washing chromatographic strips. N. N. Tunitskii and I. M. Shenderovich (I. Ya. Karpov Phys.-Chem. Inst.). *Doklady Akad. Nauk S.S.S.R.* 81, 649–50 (1951).—The basic parameters of a chromatographic strip (center of gravity, av. width, and the nature of asymmetry) have been detd. by statistical methods. J. Rovtar Leach



KOLOTYRKIN, V.M.; TIKHOMIROV, M.V.; TUNITSKIY, N.N.; SEMENOV, N.N., akademik.

Mass spectrum of methane at increased pressure. Dokl.AN SSSR 92 no.6:1193-1195 O '53. (MLRA 6:10)

1. Akademiya nauk SSSR (for Semenov). 2. Fiziko-khimicheskiy institut im. L.Ya.Karpova (for Kolotyrkin, Tikhomirov and Tunitskiy).
(Methane) (Spectrum analysis)

Tunitskiy, N.N.

USSR/ Physics - Physical chemistry

Card 1/1 : Pub. 147 - 18/22

Authors : Tunitskiy, N. N.; Cherneva, E. P.; and Andreyev, V. I.

Title : On the theory of the dynamics of sorption and chromatography. Part 3.- The dynamics of ion-exchange sorption during intradiffusion kinetics.

Periodical : Zhur. fiz. khim. 28/11, 2006-2020, November 1954

Abstract : The dynamics of ion-exchange sorption was investigated to determine the behavior of the sorbent layer in a flow containing the sorption substance. The conditions favorable for parallel transfer for ion-exchange sorption are indicated. The term expressing the time loss of the protective effect is introduced. The role of internal diffusion and hydrodynamic factors in the sorption dynamics, is explained. The experimental data obtained for calcium sorption with cationite in H-form, hydrogen sorption with cationite in Ca-form and sorption of radioactive calcium with cationite in Ca-form were found to be in excellent conformity with the theoretical data. Twelve USSR references (1929-1953). Tables; graphs.

Institution : The L. Ya. Karpov Physico-Chemical Institute, Moscow

Submitted : March 26, 1954

TUNITSKIY, N.N.

537.56.3

USSR 4520. [illegible] spectrum of methane at elevated pressures. M. [illegible], M. V. [illegible] and N. N. [illegible] ([illegible] SSSR, 92, No. 6, 1193-5 (1954) In Russian

Presents the results of studies on the pressure-dependence of the "fractional" peaks 11[illegible] and 10[illegible], occurring in CH_4 as a result of processes $CH^{+} \rightarrow C^{+} + H$ and $CH_2^{+} \rightarrow C^{+} + 2H$. The dependence of the intensity (I) of the primary peaks on pressure (p) can be represented by the formula $I = (Ap - Bp^2) \exp(-\kappa p)$, where A is the probability of the primary peak being formed by a collision with an electron, Bp^2 is the term allowing for the possibility of a change in the number of resultant ions, due to collisions in the ionic source, and κ is the coefficient of scattering. If the coefficients of scattering are equal for the primary and secondary ions, then the intensity of the [illegible] for $B = 0$ and small values of κp, the [illegible] ([illegible]). Experiments conducted with a 60 mass spectrometer show that, for the peaks 11 [illegible] and 10 [illegible], I^{*}/I is proportional to [illegible], and (2), at small pressure values, proportional to pressure. The cross-section of the reaction CH^{+} [illegible] H is of the order of $1 \cdot 10^{-16}$ cm².

P. LACHINSKI

TUNITSKIY, N. N.

USSR/Chemistry - Physical chemistry

Card 1/1 Pub. 22 - 24/45

Authors : Tunitskiy, N. N.

Title : The layer method of calculating chromatographic processes

Periodical : Dok. AN SSSR 99/4, 577-579, Dec 1, 1954

Abstract : The layer method for the calculation of chromatographic separation processes, based on the assumption that the continuous process in the column can be considered as a series of equilibriums in the small layers of a sorbent, is described. Some results obtained from calculations in accordance with the layer method are listed. Seven references: 6-USSR and 1-USA (1947-1953).

Institution : The L. Ya. Karpov Physico-Chemical Institute

Presented by: Academician M. M. Dubinin, July 3, 1954

Tunitskiy, N. N

USSR/Physical Chemistry - Photochemistry. Radiation Chemistry. Theory of the Photographic Process, B-10

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 470

Author: Tunitskiy, N. N., Kupriyanov, S. Ye., and Tikhomirov, M. V.

Institution: Academy of Sciences USSR

Title: Effect of Electrons of Different Energies on the Ionization and Dissociation of Some Hydrocarbon Halides

Original Periodical: Sb. rabot po radiatsionnoy khimii, Moscow, Publishing House of the Academy of Sciences USSR, 1955, 223-240

Abstract: The ionization and dissociation of halogen derivatives of hydrocarbons has been carried out with a type MS-1 mass spectrometer, supplemented as follows: (1) automatic scanning of the mass spectrum, (2) automatic recording of the mass spectrum, and (3) introduction of the sample into the ion source. The mass spectra of CH_4, CH_3Cl, CH_2Cl_2, $CHCl_3$, CCl_4, CH_3Br, and CH_3I have been recorded with electron energies of 100 ev. It is shown that as the number of halide atoms

Card 1/2

USSR/Physical Chemistry - Photochemistry. Radiation Chemistry. Theory of the Photographic Process, B-10

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 470

Abstract: in the molecule increases, the maximum intensity of the ions current shifts from the region of molecular ions to that of ions formed by the splitting off of an atom, i.e., dissociation begins to overshadow ionization. Anomalous ions and some secondary processes which occur during ionization and dissociation were investigated. The formation of H_2X^+ was observed in the mass spectra of some halogen derivatives of methane. The dependence of the ionization and dissociation of the molecules CH_3I, $C_2H_2Cl_4$, CH_3Br, and CH_3Cl on the electron energy (up to 1,100 ev) was investigated. It is shown that as the energy of the ionizing electrons increases, the mass spectra contained fewer fragment ions.

Card 2/2

KUPRIYANOV, S.Ye.; DZHAGATSPANYAN, R.V.; TIKHOMIROV, M.V.; TUNITSKIY, E.N.

Mass-spectrometric method of analyzing chlorine derivatives of methane. Zav.lab.21 no.10:1182-1188 '55. (MLRA 9:1)

1.Nauchno-issledovatel'skiy fiziko-khimicheskiy institut imeni L.Ya.Karpova.
(Mass spectrometry) (Methane)

TUNITSKIY, N N

USSR/Physics - Physical chemistry

Card 1/2 Pub. 22 - 32/51

Authors : Tikhomirov, M. V.; Kolotyrkin, V. M.; and Tunitskiy, N. N.

Title : About the dissociation of primary ions in a mass-spectrometer

Periodical : Dok. AN SSSR 101/5, 903-905, Apr 11, 1955

Abstract : The relation between the intensity of "fractional" n-butane peaks and pressure was investigated to explain the mechanism of primary ion dissociation at greater pressures. It is pointed out that the dissoc.-ation at greater pressures. It is pointed out that the dissociation during collision, as in the case of spontaneous decomposition, may depend upon the ion excitation and that the excitation varies depending upon the energy of the ionizing electrons. It was found that the relative intensity of the "fractional" peaks increases with the electron

Institution : The A. A. Zhdanov State University, Leningrad

Presented by: Academician A. N. Terenin, November 14, 1954

Card 2/2 : Pub. 22 - 32/51

Periodical : Dok. AN SSSR 101/5, 903-905, Apr 11, 1955

Abstract : energy, this is due to the fact that the spontaneous decomposition of the ions and their decomposition during collisions depend in various degrees upon the electron energy. Eight references: 3 German, 2 USSR, 2 USA and 1 English (1939-1953). Graphs.

TUNITSKIY, N. N.

USSR/ Physics - Physical chemistry

Card 1/1 Pub. 22 - 28/47

Authors : Tunitskiy, N. N.; Smirnova, R. M.; and Tikhomirov, M. V.

Title : About "broken" peaks in the mass spectrum of hydrogen

Periodical : Dok. AN SSSR 101/6, 1083 - 1084, Apr. 21, 1955

Abstract : A 60° mass spectrometer of low resolving power and magnetic sweep of the mass spectrum was employed in determining the relation between the cross sections of H_2^+ ion dissociation and the energies of the ionizing electron beam. It is shown that the dissociation process results in the formation of a blurred peak (band) in the mass spectrum of hydrogen at an apparent mass of 1/2. It was established that the (1/2) peak, corresponding to dissociation protons, has a width approximately 5 times greater than the basic peak. The relation between dissociation cross section and ion energy is explained. Five references: 4 USSR and 1 German (1939-1954). Graphs.

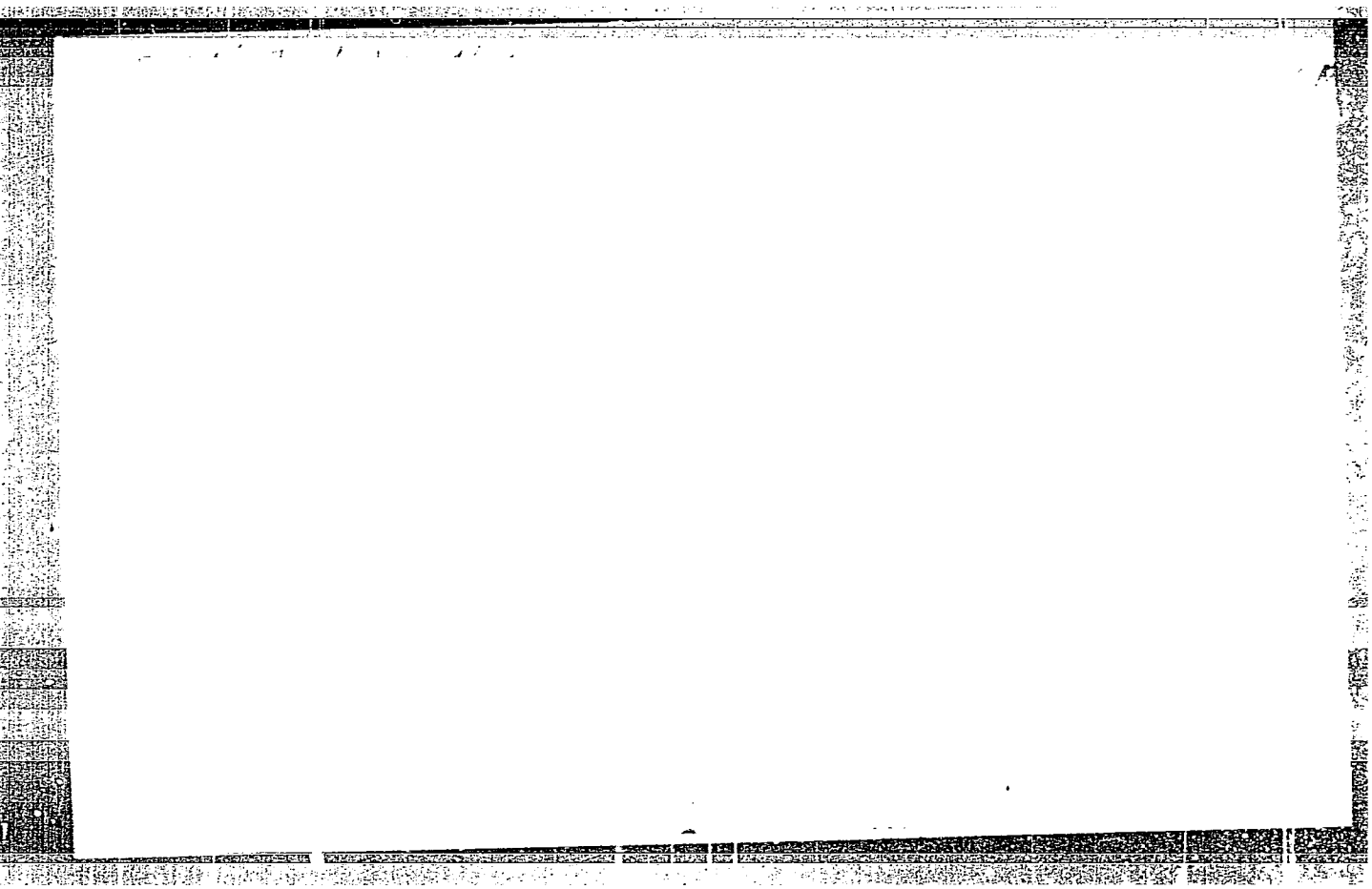
Institution : The L. Ya. Karpov Sc. Res. Phys. Chem. Inst.

Presented by: Academician V. N. Kondratyev, November 12, 1954

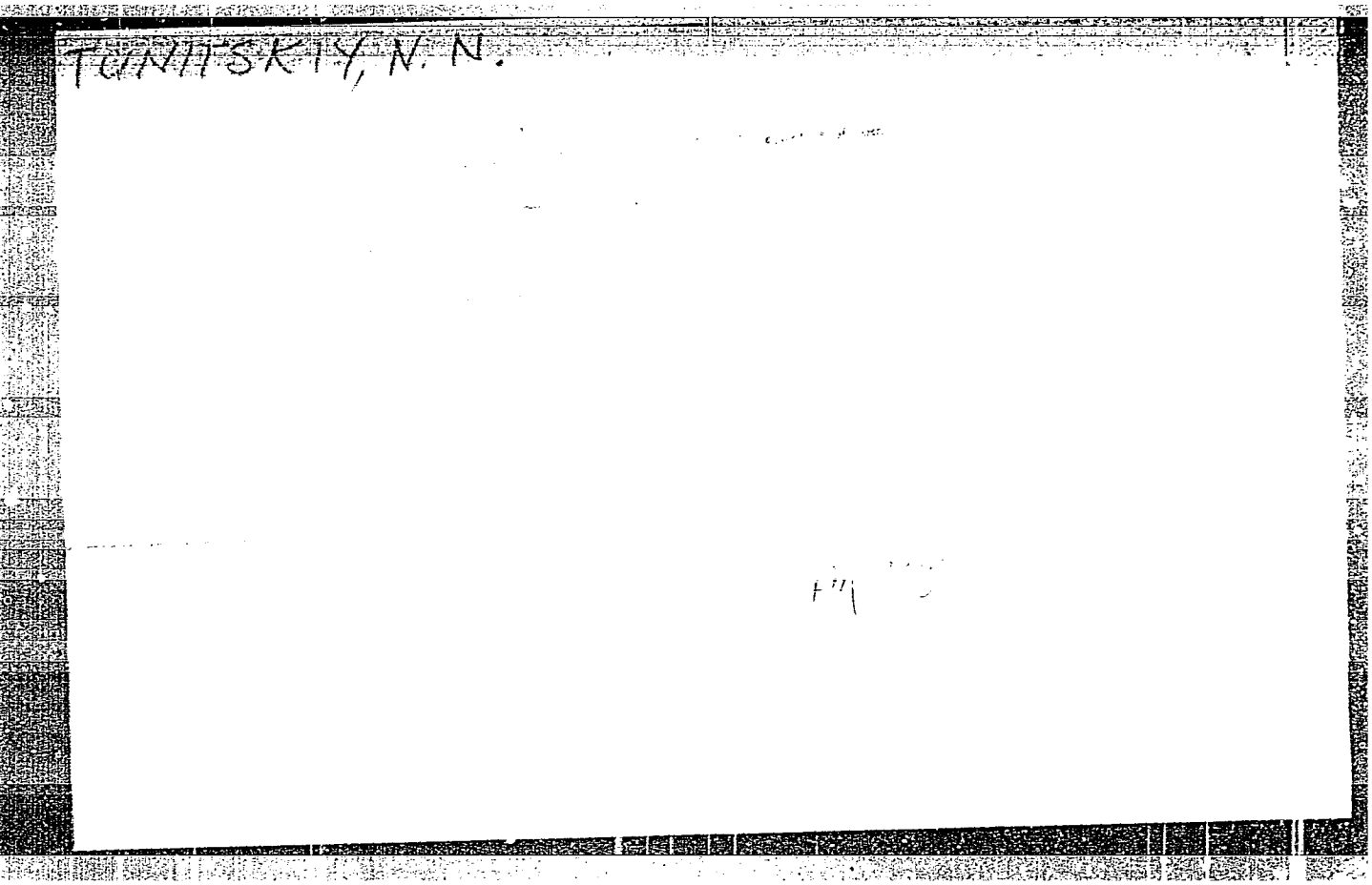
DZHAGATSPANYAN, R.V.; TUNITSKIY, N.N.

Experimental study of the dilution of chromatographic bands.
Dokl.AN SSSR 105 no.6:1282-1284 D '55. (MLRA 9:4)

1.Fizike-khimicheskiy institut imeni L.Ya.Karpova. Predstavlene akademikom V.A.Karginym.
(Chromatographic analysis)



APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757510003-2"



TUNITSKIY, N. N. (Prof.)

"The Molecule- and Ionic Dissociation in the Mass Spectrometer."

report presented at Scientific Conference at the Inst. for Physical Chemistry imeni L. Ya. Karpov, Acad. Sci. USSR, Nov 1957.

SOV/137-58-7-14194

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 33 (USSR)

AUTHOR: Tunitskiy, N. N.

TITLE: Theory of Ion-exchange Processes (Teoriya ionoobmennykh protsessov)

PERIODICAL: V sb.: Materialy Soveshchaniya po primeneniyu ionnogo obmena v tsvetn. metallurgii. Moscow, 1957, pp 4-16

ABSTRACT: Bibliographic entry

1. Ion exchange--Theory

Card 1/1

SOV/137-58-9-18449

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 38 (USSR)

AUTHORS: Cherneva, Ye. P., Tunitskiy, N. N.

TITLE: Diffusion Through Ion-exchange Membranes (Diffuziya cherez ionnoobmennyye membrany)

PERIODICAL: V sb. Materialy Soveshchaniya po primeneniyu ionnogo obmena v tsvetn. metallurgii, Moscow, 1957, pp 43-47

ABSTRACT: The ranges of technical application of ion-exchange membranes are traced. The rates of permeation of cations through a cationite membrane on both sides of which different solutions were present initially were studied.

G. S.

1. Ion exchange--Theory

Card 1/1

TUNITSKIY, N.N.; TIKHOMIROV, M.V.; KUPRIYANOV, S.Ye.; KOLOTYRKIN, V.M.; GUR'YEV, M.V.; POTAPOV, V.K.

Studies in the field of mass spectrometry. Probl.fiz.khim. no.1:122-128 '58. (MIRA 15:11)

1. Laboratoriya adsorbtsionnykh protsessov Nauchno-issledovatel'skogo fiziko-khimicheskogo instituta im. Karpova.

(Mass spectrometry)

TUNITSKIY, N.N.

21(8) p 3 PHASE I BOOK EXPLOITATION SOV/1140

Vsesoyuznoye soveshchaniye po radiatsionnoy khimii. 1st, Moscow, 1957.

Trudy (Transactions of the First Conference on Radiation Chemistry) Moscow, Izd-vo AN SSSR, 1958. 330 p. 4,000 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk, and U.S.S.R. Ministerstvo khimicheskoy promyshlennosti.

Editorial Board: Bakh, N.A. Professor (resp. ed.); Medvedev, S.S., Corresponding Member, Academy of Sciences, USSR; Veselovskiy, V.I., Professor, Dolin, P.I., Doctor of Chemical Sciences; Miller, N.B., Candidate of Chemical Sciences; Tsetlin, B.L., Candidate of Chemical Sciences (Secretary). Eds. of Publishing House: Trifonov, D.N. and Bugayenko, L.T.; Tech. Ed.: Moskvicheva, N.I.

PURPOSE: This book publishes the reports of the First All-Union Conference on Radiation Chemistry in Moscow, March 25 - 30.

COVERAGE: This collection includes fifty-seven reports and follow-up discussions of each sub-group of reports classified as follows:

Card 1/15

1) primary functions in radiation-chemical processes,
2) radiation chemistry of water solutions (inorganic and organic systems),
3) radiation-electrochemical processes,
4) the effect of radiation on substances which take part in biochemical processes,
5) radiation chemistry of simple organic systems,
6) radiation effects on polymers, and
7) sources of radiation.

According to the editors, the discussions reveal differences in points of view of Soviet scientists on various problems of radiation chemistry; specifically, the mechanism of the action of radiation on concentrated water solutions, the practical importance of radiation-galvanic phenomena, the mechanism of the action of radiation on polymers, etc. The editors also note that the conference revealed inadequate development in some important areas of radiation chemistry, particularly the theory of initiation of radiolysis, and the action of radiation on solid bodies.

TABLE OF CONTENTS: